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U.S. Army Center for Health Promotion and Preventive Medicine

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PYROTECHNICS HEALTH RISK ASSESSMENT
NO. 39-EJ-1485-00
RESIDENTIAL EXPOSURE FROM INHALATION OF
AIR EMISSIONS FROM THE
M18 RED-COLORED SMOKE GRENADE
DEPARTMENT OF DEFENSE IDENTIFICATION CODE: G950





Environmental Health Risk Assessment & Risk Communication Program



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Readiness Thru Health

U.S. Army Center for Health Promotion and Preventive Medicine

The lineage of the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) can be traced back over 50 years. This organization began as the U.S. Army Industrial Hygiene Laboratory, established during the industrial buildup for World War II, under the direct supervision of the Army Surgeon General. Its original location was at the Johns Hopkins School of Hygiene and Public Health. Its mission was to conduct occupational health surveys and investigations within the Department of Defense's (DOD's) industrial production base. It was staffed with three personnel and had a limited annual operating budget of three thousand dollars.

Most recently, it became internationally known as the U.S. Army Environmental Hygiene Agency (AEHA). Its mission expanded to support worldwide preventive medicine programs of the Army, DOD, and other Federal agencies as directed by the Army Medical Command or the Office of The Surgeon General, through consultations, support services, investigations, on-site visits, and training.

On 1 August 1994, AEHA was redesignated the U.S. Army Center for Health Promotion and Preventive Medicine with a provisional status and a commanding general officer. On 1 October 1995, the nonprovisional status was approved with a mission of providing preventive medicine and health promotion leadership, direction, and services for America's Army.

The organization's quest has always been one of excellence and the provision of quality service. Today, its goal is to be an established world-class center of excellence for achieving and maintaining a fit, healthy, and ready force. To achieve that end, the CHPPM holds firmly to its values which are steeped in rich military heritage:

- ★ Integrity is the foundation
 - ★ Excellence is the standard
 - ★ Customer satisfaction is the focus
 - ★ Its people are the most valued resource
 - ★ Continuous quality improvement is the pathway

This organization stands on the threshold of even greater challenges and responsibilities. It has been reorganized and reengineered to support the Army of the future. The CHPPM now has three direct support activities located in Fort Meade, Maryland; Fort McPherson, Georgia; and Fitzsimons Army Medical Center, Aurora, Colorado; to provide responsive regional health promotion and preventive medicine support across the U.S. There are also two CHPPM overseas commands in Landstuhl, Germany and Camp Zama, Japan who contribute to the success of CHPPM's increasing global mission. As CHPPM moves into the 21st Century, new programs relating to fitness, health promotion, wellness, and disease surveillance are being added. As always, CHPPM stands firm in its commitment to Army readiness. It is an organization proud of its fine history, yet equally excited about its challenging future.

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PYROTECHNICS HEALTH RISK ASSESSMENT NO. 39-EJ-1485-00 RESIDENTIAL EXPOSURE FROM INHALATION OF AIR EMISSIONS FROM THE M18 RED-COLORED SMOKE GRENADE

EXECUTIVE SUMMARY

This assessment evaluated the potential for human health effects to offsite residents breathing air emissions following use of the M18 Red-Colored Smoke Grenade (red-colored M18) during training exercises. The military uses pyrotechnics for signaling, obscuring, and illuminating during training and combat. Pyrotechnics are also used during training exercises to simulate battle conditions. Study results showed that no adverse health effects are expected, to the hypothetical resident, from inhalation of the air emissions from the red-colored M18.

To conduct this study, air emissions from the red-colored M18 were collected in a test chamber (Bang Box) at Dugway Proving Ground, Utah. The data collected from the Bang Box study provided the amount and types of substances released from the red-colored M18. This information was then used in an air dispersion model to determine ambient air concentrations at a location 100 meters (328 feet) downwind from a site where the red-colored M18 may be used. Since the training facility in this study is hypothetical, the air model used assumptions that provided conservative estimates of air concentrations.

Modeled air concentrations were combined with exposure information (e.g., number of exposures per year) to estimate the amount of each substance the hypothetical resident breathes. This intake was combined with the substance's health information, which was obtained from agencies such as the U.S. Environmental Protection Agency, to determine if there is a potential for health risks from inhalation of these substances.

The health risk study included both long-term (30 years) and short-term (15-minute or 1-hour) exposures to modeled substance concentrations. Study results showed that no adverse health effects are expected to be experienced, by the hypothetical resident, from inhalation of air emissions from the red-colored M18.

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LIST OF ACRONYMS

AEC U.S. Army Environmental Center

AEGL Acute Exposure Guideline Levels

AIHA American Industrial Hygiene Association

ATV Acute Toxicity Value

DOE U.S. Department of Energy

EPA U.S. Environmental Protection Agency

ERPG Emergency Response Planning Guidelines

HBSL Health-Based Screening Level

HCI Hydrogen Chloride

NAAQS National Ambient Air Quality Standards

NAC/AEGL National Advisory Committee for Acute Exposure Guideline Levels

NEW Net Explosive Weight

OEL Occupational Exposure Limit

PM₁₀ Particulate Matter under 10 micrometers in size

PRG Preliminary Remediation Goals

RBC Risk-Based Concentration

RfC Reference Concentration

TEEL Temporary Emergency Exposure Limits

TPHCWG Total Petroleum Hydrocarbon Criteria Working Group

TSP Total Suspended Particulates

USACHPPM U.S. Army Center for Health Promotion and Preventive Medicine

PYROTECHNICS HEALTH RISK ASSESSMENT NO. 39-EJ-1485-00 RESIDENTIAL EXPOSURE FROM INHALATION OF AIR EMISSIONS FROM THE M18 RED-COLORED SMOKE GRENADE

1. PURPOSE

This document presents the evaluation of the potential for adverse human health effects to offsite residents breathing air emissions following use of the M18 red-colored smoke grenade (red-colored M18) during training exercises.

2. AUTHORITY

Memorandum, U.S. Army Environmental Center, 4 June 1999, Subject: Pyrotechnics Risk Assessment.

3. REFERENCES

See Appendix A.

4. BACKGROUND

a. PYROTECHNICS AND THEIR USE

The term pyrotechnic is derived from the Greek words "pyr" and "techne" meaning fire and art. The terms pyrotechnics and fireworks are often used interchangeably. Examples of pyrotechnics include distress flares and fireworks used for commercial (public displays) and consumer use (e.g., sparklers). Every year, during New Year's Eve and Independence Day, fireworks are used for public displays across the country. For example, during the Year 2000 Independence Day celebration in New York City, 60,000 shells were launched during a firework display that lasted for 30 minutes.

The military uses pyrotechnics for four purposes: 1) as a method of communication through the use of signals, 2) to produce smoke to reduce enemy effectiveness, 3) for illuminating the field, and 4) to simulate battle conditions during training exercises. Pyrotechnics play an important role in both military training and combat. It is important that our troops are adequately trained to use them properly.

b. WHAT IS THE RED-COLORED M18?

The M18 smoke grenade is a type of pyrotechnic device used by troops for ground-to-ground or ground-to-air signaling (Reference 1). The M18 may be filled with one of four different smoke colors. These different colored smoke

signals can be seen over great distances when used against a terrain background of contrasting colors.

The red-colored M18 is 5.75 inches long, 2.50 inches in diameter, and weighs 19 ounces (Reference 2). The body of the red-colored M18 consists of a thin cylinder of sheet metal that is filled with a red smoke mixture. This mixture is made up mostly of a red dye, potassium chlorate, and sodium bicarbonate (same as baking soda).

c. USE OF THE RED-COLORED M18

M18s are used during many Army training events. These events are held at nearly every Army training installation. At most locations, the training areas are at least 1000 meters (over half a mile) away from populated areas. In general, two red-colored M18s are used during a day of training, which typically occurs five times per year.

The M18 contains a delay-igniting fuze so that smoke is not released immediately after the grenade is activated. This allows the soldier to throw the grenade, usually to a distance of approximately 35 meters (115 feet), before smoke is produced. The M18 will emit a cloud of colored smoke for 50 to 90 seconds. This colored smoke can be used for different purposes. For example, it can be used to mark friendly force locations for other ground troops. It can also be used to mark a landing zone during operations such as medical evacuation (Reference 3).

d. ASSESSMENT SUMMARY

The approach for this study consisted of two main portions: air dispersion modeling and exposure assessment. These are briefly discussed in the paragraphs below. Sections 5-7 present a more explicit discussion of the methodology used for this study.

Emissions data generated from the studies in the Bang Box at Dugway Proving Ground, Utah (Reference 4), were used with an atmospheric dispersion model to estimate the average concentrations that may be experienced by an offsite resident. Since this study is designed to provide results that would be applicable to most Army training facilities, the training area used in this evaluation was a hypothetical one. In addition, air-modeling parameters were selected to mimic worst-case conditions.

The exposure assessment included calculations of time-averaged concentrations for both long-term (chronic) and short-term (acute) exposures. For the purpose of this study, air concentrations were averaged over 30 years for chronic exposures and 1-hour or 15 minutes for acute exposures. These concentrations were compared to chronic health-based screening levels

(HBSLs) established by the U.S. Environmental Protection Agency (EPA) or acute toxicity values (ATVs) established by selected agencies depending on the exposure duration (i.e., 30 years versus 1-hour or 15 minutes). If the chronic or acute averaged concentrations (C_{chronic} and C_{acute}) were greater than these screening levels, further analysis would be warranted to determine the potential for health effects. It should be noted that concentrations greater than the screening levels do not indicate an onset of health effects, but rather the potential for such.

5. METHODS AND DATA COLLECTION

a. EMISSION FACTORS

Emission factors used to derive the air modeling emission rates used in this study were generated from the pyrotechnics emissions studies conducted in the Bang Box at Dugway Proving Ground, Utah (Reference 4). The Bang Box studies identified and quantified air emissions from the firing of training munitions. The data provided by the Bang Box studies included the net explosive weight (NEW) of the item, the compounds sampled, and compound-specific emission factors. Emissions data from the Bang Box studies are included in the first four columns of the air dispersion modeling output data in Appendix B.

b. AIR MODEL

(1) BACKGROUND

Air dispersion models are available to mathematically simulate plume behavior to estimate downwind concentrations of compounds emitted from various sources. However, specific models are not available to determine the dispersion of emissions from munitions used during training. Estimating the magnitude and location of these concentrations depends on many factors including the amount and type of emissions, the behavior of the source, and meteorological conditions. Since a specific model is not available for modeling the use of munitions during training, the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) evaluated numerous air models to determine which would be suitable for use with munitions used during training. The USACHPPM recommended using the Integrated PUFF (INPUFF) model to estimate the dispersion of emissions from sources such as pyrotechnics (Reference 5).

(2) MODEL DESCRIPTION

The INPUFF Model (Reference 6) was developed to simulate dispersion from instantaneous or semi-continuous point sources. This Gaussian-integrated puff model is capable of addressing a cloud type release over short periods of

time, and computations can be performed for a single point source for multiple receptors. The algorithms used to calculate concentrations assume a vertically uniformed wind direction (with no chemical reaction) to compute the contribution of each cloud at a receptor for each time step/interval.

(3) ASSUMPTIONS

Some assumptions were made to best represent the red-colored M18 in the air model. These assumptions were as follows:

(a) Initial cloud dimensions are preferred to model the air emissions from these types of releases. However, this information was not measured during the Bang Box studies; therefore, assumptions had to be made. Typically, with conventional point sources, the cloud rise and formation are determined by characterizing flue gas exit velocity, temperature, and stack diameter. However, for unconventional sources with no physical stack dimensions, such as the red-colored M18, the cloud temperature was set close to the ambient temperature, and a low exit velocity (0.1 meter per second) was used. Using a low exit velocity assumes essentially no cloud rise resulting in higher ground level concentrations to provide a more conservative estimate of air emissions. The source parameters used to model the red-colored M18 are included in Table 1.

TABLE 1: SOURCE PARAMETERS

Source/Stack Diameter	0.061 meters
Source/Stack Height	0.15 meters
Source Exit Temperature	298.15 degrees Kelvin (°K)(or 77 °F)
Exit Velocity	0.1 meters/second

(b) Since this study does not look at a specific training site, generic, worst-case meteorological data were used. To determine the worst-case meteorological conditions that would result in the highest air emission concentrations, an analysis was performed using the EPA Risk Management Program Guidance (Reference 7). This guidance includes tables for estimating the footprint of chemical releases and is intended to inform emergency responders of potential accidental releases. The EPA has defined most default conditions for meteorological modeling parameters. Table 2 lists the meteorological parameters that were used in the air model.

TABLE 2: WORST-CASE METEOROLOGICAL PARAMETERS

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Wind Speed	1 meter/second
Atmospheric Stability	Category F
Wind Direction	270°
Ambient Temperature	293 degrees Kelvin (°K) (or 68 °F)

(c) For the purposes of this study, a hypothetical offsite resident was assumed to be located 100 meters directly downwind from the source. The meander of the cloud is a major factor when estimating concentrations at given locations downwind from the source. Assuming that the resident is directly downwind from the source is the same as assuming that there is no cloud meander and therefore the cloud remains more concentrated. This assumption provides the most conservative modeled concentrations.

(4) GENERAL METHODOLOGY

- (a) For the red-colored M18, the highest modeled concentrations were seen at the 100-meter location. This means that concentrations at distances greater than 100 meters were lower. This location was used in the exposure evaluation to provide the most conservative estimates of air emissions that offsite residents may be exposed.
- (b) The model was run for a total calculation time of 900 seconds (15 minutes) to ensure that the total mass of the cloud had passed the receptor locations and to acquire 15-minute average concentrations for use in the exposure evaluation. Concentrations were calculated every two seconds. The model indicated that the initial cloud reached the hypothetical offsite resident within 80 seconds and dissipated below the lowest concentration the model calculated, which in this instance (1 x 10⁻¹⁰ g/m³) occurred within 240 seconds. Table 3 contains the air model input parameters used in this study.

TABLE 3: AIR MODEL INPUT PARAMETERS

1
900 seconds
15
60 seconds
900 seconds

(5) USE OF MODEL OUTPUT

The concentrations provided by the INPUFF model were based on a unit emission rate of 1 gram/second from an emission source and did not represent any pollutant-specific concentrations from the use of pyrotechnics. This unit emission rate is typically used for ease of modeling purposes. The relationship between the emission rate and predicted concentration is linear. Therefore, the ratio of the predicted concentration to the unit emission rate was multiplied by each pollutant-specific emission rate to provide pollutant-specific concentrations.

(6) DETERMINATION OF POLLUTANT-SPECIFIC EMISSION RATES

(a) The actual pollutant emission rate per item (ER₁) for each pollutant was calculated using the following equation:

$$ER_1 = \frac{M \cdot CV}{t}$$
 Equation 1

where:

 ER_1 = emission rate for one item (g/(item*sec))

M = total mass (lb) of pollutant emitted per item (lb/item)

CV = conversion factor (453.59 g/lb)

 t = release duration in seconds as obtained from the training manual (References 2, 8)

Example 1 Sample Calculation Using Equation 1:

$$ER_1 = \frac{(1.510 E-01)(453.59)}{(120)}$$

= 5.706E-01 g/(s*item)

Calculation provided for total suspended particulates (TSP). Averaged adjusted emission factor of TSP in lb/item was obtained from Appendix B.

(c) Pollutant-specific ambient concentrations for one item (CONC) were calculated using the following equation:

$$CONC = ER_{EV} \cdot \frac{UC}{ER_{unit}}$$
 Equation 2

where:

CONC = pollutant concentration based on one item (g/m³)

ER₁ = emission rate for one item (g/s)

 ER_{unit} = unit emission rate as used in the model (g/sec)

UC = concentration based on the unit emission rate (g/m³)

Example 2
Sample Calculation Using Equation 2:

CONC =
$$(5.706E - 01)\frac{(3.510E - 03)}{(1)}$$

 $= 2.003E-03 g/m^3$

Calculation provided for TSP.

c. EXPOSURE ASSESSMENT

- (1) EXPOSURE ASSUMPTIONS
- (a) Exposure assumptions were selected using a typical use scenario for the red-colored M18. This use scenario was provided by the U.S. Army Environmental Center (AEC), and is based on consultation with their senior training advisor (References 9, 10). This information is included below in Table 4 and is used for the chronic and acute exposure evaluations.

TABLE 4: FREQUENCY OF USE FOR THE RED-COLORED M18

Value Used
2 over a 24-hour period
NA NA
NA NA
NA
5

(b) The frequency of use for the red-colored M18 was required to determine how much substance an offsite resident would be exposed to in the time period of interest (i.e., acute or chronic exposure). For the purposes of this study, a training scenario is defined as a day or session of training whereas a training event is defined as a single use of pyrotechnics. A training scenario may consist of multiple training events.

(2) TIME-AVERAGING

- (a) For the chronic assessment, time-averaged concentrations were calculated using the EPA's default residential exposure duration of 30 years (this value assumes that the resident spends 30 years at the same residence). This was done to derive concentrations that would be consistent with the exposure duration used by the EPA so that estimated substance concentrations could be compared to their respective health-based screening levels.
- (b) In this evaluation, training scenarios were assumed to occur five times a year (References 9, 10). Using the default residence time established by the EPA, the assumption was made that someone could be exposed to five training scenarios per year for 30 years. Table 5 lists the exposure parameters used to estimate concentrations for the chronic assessment. These parameters are based on the typical use scenario provided by AEC (Table 4) and the assumptions used in the air model run.

TABLE 5: EXPOSURE PARAMETERS USED TO DETERMINE TIME-AVERAGED CHRONIC AIR CONCENTRATIONS

Exposure Parameter	Value Used
Exposure Time (ET)	15 minutes/item ¹
Exposure Frequency (EF _{day})	2 items/day ²
Exposure Frequency (EF _{year})	5 days/year ²
Exposure Duration (ED)	30 years ³
¹ Based on the total model time of 900 seconds (15 m ² From Table 4. ³ EPA default value.	ninutes) used in the air model run.

(c)The daily averaged concentrations were calculated using Equation 3. To continue with the examples used previously (Examples 1 and 2), TSP is used to illustrate how this equation is applied. It should be noted that the

average modeled concentration was converted from g/m^3 to $\mu g/m^3$ before it was used in Equation 3.

$$C_d = \frac{CONC \cdot ET \cdot EF_{day}}{1440}$$
 Equation 3

where:

 C_d = average daily concentration ($\mu g/m^3$)

CONC = average modeled concentration for one item (μg/m³)

ET = exposure time (minutes/item)
 EF_{day} = exposure frequency (items/day)
 1440 = unit conversion from minutes to day

Example 3
Sample Calculation Using Equation 3:

$$C_{d(TSP)} = \frac{(2.003E + 03)(15)(2)}{1440}$$
$$= 4.173E + 01 \,\mu\text{g/m}^3$$

The averaged modeled concentration (CONC) for TSP was obtained from Appendix B. The exposure parameters were obtained from Table 5.

(d) Chronic averaged concentrations were calculated using Equation 4. The resulting concentration (C_d) from Equation 3 was used in Equation 4 to determine the averaged chronic concentrations. Example 4 shows how this calculation was performed.

$$C_{chronic} = \frac{C_d \cdot EF_{year} \cdot ED}{AT}$$
 Equation 4

where:

 $C_{chronic}$ = average chronic concentration (μ g/m³) C_d = average daily concentration (μ g/m³) EF_{year} = exposure frequency (days/year) ED = exposure duration (years)

Example 4 Sample Calculation Using Equation 4:

$$C_{chronic(TSP)} = \frac{(4.173E + 02)(5)(30)}{(30)(365)}$$
$$= 5.72E-01 \,\mu\text{g/m}^3$$

The average daily concentration was calculated as shown in Example 3. The exposure parameters were obtained from Table 5.

- (e) Unlike the chronic evaluation, guidance for evaluating acute exposures is not currently available. Due to the nature of the use of pyrotechnics, acute exposures cannot be overlooked. For the purpose of this study, acute exposure is defined as a 1-hour or 15-minute exposure. The 1-hour or 15minute acute exposure averaging times allow for comparison with guidelines developed specifically for emergency planning purposes (see discussion on acute toxicity below).
- (f) The exposure frequency is based on the number of events per 1-hour or 15 minutes depending on the guideline used for comparison. This information is based on the use scenario provided by AEC (Table 4). To determine the maximum number of items that may be used in 1-hour, it was conservatively assumed that two red-colored M18s might be activated all at once during an event. The average acute concentrations were computed using Equation 5. Example 5 contains a sample calculation of this equation. Since TSP does not have an acute toxicity value, hydrogen chloride (HCl) is used as the example compound.

$$C_{acute} = \frac{CONC \cdot ET \cdot EF_{hour}}{60}$$
 Equation 5

where:

 C_{acute} = average acute concentration ($\mu g/m^3$)

CONC = average modeled concentration for one item (µg/m³)

ET = exposure time (minutes/item)
EF_{hour} = exposure frequency (items/hour)

e unit conversion, 60 minutes/hour

Example 5 Sample Calculation Using Equation 5:

$$C_{acute(HCI)} = \frac{(3.64E - 02)(2)(15)(1/0.25)}{60}$$
$$= 7.28E-2 \,\mu\text{g/m}^3$$

The average modeled concentration (CONC) for HCl was obtained from Appendix B. Since the acute toxicity value for HCl is based on a 15-minute exposure duration (TEEL), the acute concentration was averaged over 15 minutes (0.25 hours) so that C_{acute} can be compared with its toxicity value.

d. TOXICITY ASSESSMENT

The potential for adverse health effects was determined by comparing timeaveraged air concentrations to health-based screening levels, which are developed from a substance's known toxicity. These toxicity values typically include different levels of safety factors depending on the level of confidence of the critical study. Appendix C contains a table of screening values used for the chronic and acute evaluations.

(1) CHRONIC ASSESSMENT

- (a) The chronic assessment was evaluated using a screening approach. Using this method, a substance's estimated time-averaged air concentration was compared to its HBSL. If this ratio was less than one, no further analysis was required. This approach is conservative because the exposure assumptions used by the EPA, to establish HBSLs, assume that the resident is exposed for 350 days per year (assuming 2 weeks vacation per year). Since the training scenarios, in which the red-colored M18 is used, are not expected to exceed five days per year, HBSLs specific to this study (if they were developed) would likely be higher.
- (b) The HBSLs were obtained from the EPA, primarily from Region 3 and Region 9 (References 11, 12). To ensure that the most recent information was used, the Internet sites of both regions were checked. Although the general approach used by both Region 3 and Region 9 is the same, the exposure assumptions differ enough so that final recommended screening levels can vary to a certain degree. In both methods a substance's HBSL is selected using the toxicity endpoint that derives a lower concentration. For example, if a substance has a known systemic toxicity and is a carcinogen, concentrations were calculated using both toxicity values. To maintain a

conservative approach, the lower concentration was selected as the recommended screening level.

- (c) A hierarchy was developed in order to quantitatively evaluate for as many of the identified substances as possible. Since the methodology used by Region 9 results in lower HBSLs than Region 3, the Region 9 preliminary remediation goals (PRGs) were used first. Region 3's risk-based concentrations (RBCs) were only used when a PRG was not available. The only exception was for chromium (VI) [Cr (VI)] where Region 9 used a carcinogenic toxicity value that was seven times greater than the EPA's recommended value to develop its screening level for inhalation exposure (Reference 13). Since the EPA does not advocate the application of this multiplication factor, the RBC for Cr (VI) was used instead of the PRG.
- (d) Some substances have neither PRGs nor RBCs because they have their own set of regulatory standards. Under the Clean Air Act, the EPA is required to establish National Ambient Air Quality Standards (NAAQS) (Reference 14) for several substances considered harmful to public health and the environment. Currently, NAAQS are available for six substances, of which carbon monoxide, nitrogen dioxide, lead, sulfur dioxide, and particulate matter < 10 micrometers (PM₁₀) have been detected in the red-colored M18 Bang Box study. The NAAQS for the longer averaging time were used for the chronic evaluation. Depending on the substance, this can range from an 8-hour average to an annual average. In addition, since the majority of the measured TSP were PM₁₀ (Reference 4), the NAAQS for PM₁₀ was used to evaluate the potential for health effects from exposure to TSP. Example 6 shows a sample calculation of how a substance's estimated chronic concentration is compared to its HBSL.

Example 6
Sample Calculation Comparing a Substance's Estimated Chronic Concentration to Its HBSL:

$$\frac{C_{chronic(TSP)}}{HBSL} = \frac{5.72E - 01}{50}$$
$$= 1.14E-02 < 1$$

In this case, the resulting ratio is two orders of magnitude less than one, indicating further evaluation is not necessary.

(e) Many petroleum hydrocarbons were detected but do not have specific screening levels. Therefore, the approach recommended by the Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG) (Reference 15)

was adopted to evaluate petroleum hydrocarbon mixtures. Based on the working group's assessment of various hydrocarbons, it was recommended that mixtures be separated according to a substance's number of carbons and its chemical class (i.e., aliphatic or aromatic¹). Generally, as a substance's carbon number increases, its molecular weight increases and it is therefore, not a substance of concern via inhalation. The working group also concluded that aromatic hydrocarbons tend to be more toxic than aliphatic hydrocarbons (Reference 15).

(f) Table 6 tabulates the inhalation toxicity values used to evaluate exposure to petroleum mixtures. To be consistent with the methodology used in this study, the reference concentrations (RfCs) were converted to PRGs using Region 9 assumptions. The resulting PRGs are included in Table D-4 in Appendix D.

TABLE 6: SUMMARY OF RfCs USED FOR PETROLEUM HYDROCARBONS1

Carbon Range	Aromatic Inhalation RfC (mg/m³)	Aliphatic Inhalation RfC (mg/m³)
$C_5 - C_6$ $C_{>6} - C_8$		18.4
C>7 - C8	0.4	
$C_{>8} - C_{10}$ $C_{>10} - C_{12}$ $C_{>12} - C_{16}$	0.2	1.0
C _{>16} - C ₂₁ C _{>21} - C ₃₅	NA	NA

Reference 15

NA = not applicable for high molecular weight TPHs (C_{>16}) because compounds in this carbon range are not volatile and therefore, inhalation is not a pathway of concern.

(2) ACUTE ASSESSMENT

(a) As previously indicated, an acceptable method for assessing acute health effects is not currently available. It was not until recently that EPA guidance addressed the need to evaluate acute health effects from inhalation (Reference 17). Even then, acute toxicity data for risk assessment purposes were not readily available. The EPA recognized this deficiency and spearheaded the National Advisory Committee for Acute Exposure Guideline Levels for Hazardous Substances (NAC/AEGL Committee). Currently,

¹ Aliphatic hydrocarbons are hydrocarbons in which the carbon atoms are joined by single covalent bonds consisting of two shared electrons (e.g., butane). Aromatic hydrocarbons have ring structures (e.g., benzene) (Reference 16).

AEGLs are available for only a handful of substances, of which only three are found in the list of compounds from the red-colored M18 emissions data.

- (b) To circumvent this problem, several state regulatory agencies have suggested that guidelines developed for emergency purposes be used in the interim. Although suggestions have been made to use occupational exposure limits (OELs) by applying additional safety factors (References 18, 19), OELs were not used in this study because they introduce even more uncertainty than the use of emergency guidelines. The OELs are designed to protect the workplace environment and assume 8 hours a day, 5 days a week exposures. By definition, these exposures are more chronic than acute.
- (c) In comparison, emergency planning guidelines are more appropriate because they are typically developed for exposures of 1-hour or less. In addition, safety factors may also have been included depending on the agency that develops these guidelines, so that the values would be protective of the general population.
- (d) Emergency Response Planning Guidelines (ERPGs) published by the American Industrial Hygiene Association (AIHA) (Reference 20) and the Temporary Emergency Exposure Limits (TEELs) developed by the U.S. Department of Energy (DOE) (Reference 21) were used for this study, specifically the ERPG-1s and the TEEL-1s (with the exception of the three AEGLs that were available). Since TEEL-1s are intended for 15-minute exposures, air concentrations compared to TEELs were averaged over a 15minute period. Air concentrations compared to ERPGs and AEGLs were averaged over 1-hour, as these values were developed for 1-hour exposures.
- (e) The AIHA defines ERPG-1 as follows:

"The maximum concentration in air below which it is believed nearly all individuals could be exposed for up to one hour without experiencing other than mild transient adverse health effects or perceiving a clearly defined objectionable odor."

The DOE defines TEEL-1 as follows:

"The maximum concentration in air below which it is believed nearly all individuals could be exposed without experiencing other than mild transient adverse health effects or perceiving a clearly defined objectionable odor."

(f) For this study, AEGLs were used first when available since they are developed specifically for the purposes of acute exposure evaluations. ERPGs were selected next, prior to a substance's TEEL, because they are vigorously reviewed before they are published whereas the TEELs are not. Example 7 shows a sample calculation of how a substance's estimated acute concentration is compared to its acute toxicity value.

Example 7

Sample Calculation of Comparing a Substance's Estimated Acute Concentration to Its Acute Toxicity Value:

$$\frac{C_{acute(HCI)}}{ATV} = \frac{7.28E - 02}{4.47E + 03}$$
$$= 1.63E-05<1$$

In this example with HCl, the ratio is five orders of magnitude below 1, indicating that further analysis is not necessary.

6. RISK CHARACTERIZATION

Appendix D presents results from the red-colored M18 risk characterization. Note that for some substances, two concentrations were reported because of different analytical test methods (as noted in bold). In those instances, the higher concentration was used.

a. CHRONIC HEALTH RISK

The outcome indicated that no chronic health risks are expected from breathing the air emissions from the red-colored M18. Since all ratios were below one, no further evaluation was needed.

b. ACUTE HEALTH RISK

For the acute analysis, all ratios were below one, indicating that no acute health impacts are expected from breathing the air emissions from the red-colored M18. Since all ratios for the acute evaluation were below one, no further assessment was needed.

c. FACT SHEET

A copy of the fact sheet submitted to AEC is included as Appendix E. The fact sheet uses the results from this study to address health concerns related to inhalation of red-colored M18 air emissions.

7. UNCERTAINTY DISCUSSION

The limitations inherent in modeling and the added conservatism of the evaluation contribute to the uncertainty of the study results. The risk assessment methodology typically includes safety factors that are embedded in the toxicity data to ensure adequate protection of the general population, particularly, susceptible individuals such as the sick, elderly, and children. Table 7 identifies areas of uncertainty associated with this assessment.

TABLE 7: TYPES OF UNCERTAINTY

Issue	Uncertainty	Direction of Effect
	Modeling	
Modeled versus real- time sampling	The air concentrations in this study were modeled. Actual air concentrations taken from the field may be higher or lower.	Varies
Frequency of use for the red-colored M18	Actual frequency of use of red-colored M18s during a training event may be different from those stated in this report.	Varies
Hypothetical resident assumed to be located directly downwind	Unless the area around the training facility is populated, the chances that a person living directly downwind is low.	Overestimates
Use of worst-case meteorological conditions	To ensure that this study is applicable to most training areas, worst-case meteorological conditions were used in the air model.	Overestimates
	Exposure Assessment	
Estimating time- averaged concentrations	Actual exposure from the red-colored M18 is intermittent. If one were to plot a person's exposure profile, the plot would consist of a series of spikes. Since current risk assessment methodology does not allow the evaluation of the potential for health risks as a function of time, a single concentration, averaged over the exposure duration was used. In this study, the exposure durations used were 30 years and 1-hour or 15 minutes.	Varies •
Chromium speciation	All chromium was assumed to be present as Cr(VI), which is more toxic than Cr(III).	Overestimates

TABLE 7: TYPES OF UNCERTAINTY

Issue	Uncertainty	Direction of Effect
Comparing estimated concentration to established screening levels	The Region 3 and Region 9 HBSLs were developed using different exposure assumptions than those in this study, resulting in more conservative screening levels.	Overestimates
Screening assessment versus calculating an average daily intake	Calculating an average daily intake allows the use of scenario-specific assumptions. However, unless the ratio of concentration to screening level approaches one, a screening assessment is useful as a first-cut evaluation.	Varies
Exposure to other munitions	Other munitions are typically used during the same training event. These items may contain similar or different substances from those detected in the red-colored M18.	Underestimates
	Toxicity Assessment	
Lack of toxicity data	Some substances were not quantitatively evaluated because they have no known toxicity data.	Únderestimates
Modifying and uncertainty factors for toxicity data	Modifying factors and uncertainty factors of varying degree are typically applied to toxicological values. These factors are used to conservatively account for extrapolating from animal studies for human health evaluation, and to conservatively account for variation in human populations.	Overestimates

8. CONCLUSION

Results indicated that residents who live as close as 100 meters directly downwind from training areas are safe from breathing air emissions from the red-colored M18. It is believed that the assumptions contained in this analysis are conservative enough to be protective of all the population including the sick, elderly, and children.

9. RECOMMENDATIONS

Since the results from this study are intended for a hypothetical training facility, they can vary depending on site-specific conditions. However, because of the conservative assumptions used (e.g., worst-case meteorological conditions, receptor located directly downwind, etc.) it is believed that most site-specific analyses would result in even lower concentrations. Therefore, the results from this evaluation should be applicable to most training facilities unless site-specific conditions vary significantly.

10. POINT OF CONTACT

Questions about this report may be directed to Ms. Hsieng-Ye Chang at (800) 222-9698 (ext 2953) or (410) 436-2953.

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APPENDIX A
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APPENDIX B AIR DISPERSION MODELING OUTPUT DATA

Table B-1: Air Modeling Output Data for Metals, Particulates, and Miscellaneous Compounds

		Red Smoke Grenade	Gronodo				
		NEW (h = 0.72	= 0.72		Number of Items (I):		Item
		Mimbor of	10.12		Release duration (t):	120	120 seconds
		= Sille) io iequinal	i = suiai		Unit Concentration (UC):	3.51E-03	g/m³
Compound	Measured Actual Concentration (mg/m³)	Measured Background Concentration (mg/m³)	Average Adjusted Emission Factor (Ib/Ib NEW)	Average Adjusted Emission Factor (lb/Item)	Total Mass of Pollutant Emitted Per Item (grams)	Average Modeled Concentration for One Item (grams/m³)	9 12 12 13 13 13 13 13 13 13 13 13 13 13 13 13
Particulate ·						ONIOO	נואי
TSP	3.101E+03	9.029E+00	2.097E-01	1.510E-01	6.847E+01	2.003E-03	5.706F-01
							0100.00
HCI/CI ₂							
HCI (a)	7.650E-02	7.638E-02	3.812E-06	2.745E-06	1.245E-03	3.642E-08	1 0375-05
GI2 (a)	5.982E-02	5.654E-02	2.224E-07	1.601E-07	7.263E-05	2.125E-09	6.053E-07
Dioxin/Furan							
Dioxin TEQ (c)	4.753E-07	QN	3.231E-11	2.327E-11	1.055E-08	3.087E-13	8 705E-11
				·			
Ocivi aysterii							
Carbon Monoxide (CO)	1.172E+02	-6.639E-01	8.030E-03	5.782E-03	2.623E+00	7.672E-05	2.185E-02
Nitrogen Oxide (NOx)	8.659E+00	3.827E-02	5.869E-04	4.225E-04	1,917E-01	5.607E-06	1.597E-03
HCI (a)	1.543E+00	2.995E-02	9.440E-05	6.796E-05	3.083E-02	9.018E-07	2 569F-04
Carbon Dioxide (CU2)	2.275E+03	7.028E+02	1.070E-01	7.703E-02	3.494E+01	1.022E-03	2 912F-01
Sulfur Dioxide (SO2)	9.004E+00	5.857E-03	6.040E-04	4.349E-04	1.972E-01	5.770E-06	1,644E-03
Particulate nhace Metals							
Alimina Aliman	1000						
Actimom	1.063E+00	(q) WN	7.199E-05	5.183E-05	2.351E-02	6.878E-07	1.959E-04
Anuniony	1.51/E-02	(a) MN	1.038E-06	7.471E-07	3.389E-04	9.914E-09	2.824E-06
Radium	ND 4	NM (b)	ON I	Q	ON	ND	QN
Booyllim	20-316-02	NM (D)	7.165E-07	5.158E-07	2.340E-04	6.845E-09	1.950E-06
Cadmium	3.290E-03	(Q) MN	2.251E-07	1.621E-07	7.351E-05	2.150E-09	6.126E-07
Chombin	NO 101	(a) MN	QN	2	ND	QN	QN
Chalt	0.0135-03	(Q) MN	5.789E-07	4.168E-07	1.891E-04	5.531E-09	1.576E-06
Condit	2.78TE-U3	(g) WN	1.887E-07	1.359E-07	6.163E-05	1.803E-09	5.136E-07
Coppe	ON O	(D) MN	Q	Q	ON	QN	Q.
Magnetim	4.105E-01	(a) MN	2.788E-05	2.007E-05	9.105E-03	2.664E-07	7.588E-05
Magaidsidill	2.415E-U1	(Q) WN	1.647E-05	1,186E-05	5.380E-03	1.574E-07	4.484E-05
Nickel	8.665E-03	(Q) MN	5.890E-07	4.241E-07	1.923E-04	5.627E-09	1.603E-06
Dhoephoais	9.10bE-03	(a) WN	6.191E-07	4.457E-07	2.022E-04	5.915E-09	1.685E-06
riceptions	SO.	NM (b)	2	2	QN	QN	QN

B-2

Table B-1: Air Modeling Output Data for Metals, Particulates, and Miscellaneous Compounds

		Red Smoke Grenade	Grenade		Number of Items (I):	1	Item
		NEW, Ib = 0.72	= 0.72		Release duration (t):	120	120 seconds
		Number of Items =	tems = 1		Unit Concentration (UC):	3.51E-03 a/m³	n/m³
Compound	Measured Actual Concentration (mg/m³)	Measured Background Concentration (mg/m³)	Average Adjusted Emission Factor (Ib/Ib NEW)	Average Adjusted Emission Factor (ib/item)	Total Mass of Pollutant Emitted Per Item (grams)	Average Modeled Concentration for One Item (grams/m³)	10000
Selenium	Q	NM (b)	QN	S	S	ONO.	יים ל מיק
Silver	2	NM (b)	GN	S	2 2	2 2	2 2
Thallium	Q	(q) WN	Q	QV	QN	2 5	2 2
Zinc	1.933E-01	(Q) WN	1.319E-05	9.498E-06	4.308E-03	1 260F-07	3 500E 0E
Mercury	4.110E-03	NM (b)	2.776E-07	1.999E-07	9.066E-05	2.652E-09	7.555E-07
Footnotes:							0000
ND = Not Detected							

NEW = Net Explosive Weight

NM ≈ Not Measureable

CEM = Continuous Emissions Monitoring

(a) HCI/Cl₂ levels were too low to be reliably measured (except for White Smoke) (b) Insufficient material to analyze. (c) Presence questionable - reported at similar levels in samples and blanks.

Table B-2: Air Modeling Output Data for Volatile Organic Compounds

		Red Smoke Grenade	Grenade		Number of Items (I):	1	Item
		NEW, Ib = 0.72	= 0.72		Release duration (t):	120 seconds	seconds
		Number of Items =	Items = 1		Unit Concentration (UC):	3.51E-03	Juli
		day which				Average	Dollutant
	Measured Actual	Measured	Average	Average	Total Mass of Pollutant	Modeled	Emission Rate
Compound	Concentration	Background Concentration	Adjusted Emission Factor	Adjusted Emission Factor	Emitted Per Item (grams)	Concentration for One Item	for One Item
	(mg/m²)	(mg/m³)	(Ib/Ib NEW)	(lb/ltem)		(grams/m³)	(oos.B)
					Ψ	CONC	ER,
Total Nonmethane Hydrocarbons (TNMHC)					70 1000 0	00 1101 0	4 0401 00
TNMHC	1.019E+01	2.919E-01	7.042E-04	5.070E-04	2.300E-01	6.727E-06	1.916E-03
Volatile Organic Compounds (VOCs)		00 2020 7	00 1000	4 4405 06	AC 2002 A	4 0405.08	5 441E.08
Ethane	2.950E-02	1.350E-U3	1.898E-00	1.4405-00	9.33012-04	1 1210 01	2 2025 04
Ethylene	1.143E+00	3.500E-04	8.095E-05	5.829E-05	2.644E-U2	7.734E-U/	Z.ZU3E-04
Acetylene	1.728E+00	9.000E-04	1.229E-04	8.847E-05	4.013E-02	1.174E-06	3.344E-04
Propane	8.500E-03	1,200E-03	5.177E-07	3.727E-07	1,691E-04	4.946E-09	1.409E-06
Propene	2.940E-01	1.500E-04	2.083E-05	1.500E-05	6.802E-03	1.990E-07	5.668E-05
I-Butane	1.000E-03	4.000E-04	5.024E-08	3.618E-08	1.641E-05	4.800E-10	1.367E-07
-Butene	3.950E-02	1.000E-04	2.790E-06	2.009E-06	9.111E-04	2.665E-08	7.593E-06
1-Rutena	6.100E-02	S	4.323E-06 ·	3.113E-06	1.412E-03	4.130E-08	1.176E-05
1.3-Butadiene	1,500E-03	QN	1.062E-07	7.648E-08	3.469E-05	1,015E-09	2.891E-07
n-Butane	3.500E-03	7.000E-04	1.981E-07	1.426E-07	6.469E-05	1.893E-09	5.391E-07
trans-2-Butene	5.600E-02	Q	3.939E-06	2.836E-06	1.286E-03	3.763E-08	1.072E-05
2.2-Dimethylpropane	Q.	QN	QN	QN	QN	Q	Q
cis-2-Butene	1.300E-02	QN	9.144E-07	6.583E-07	2.986E-04	8.736E-09	2.488E-06
3-Methyl-1-butene	1,000E-02	QN	7.034E-07	5.064E-07	2.297E-04	6.720E-09	1.914E-06
i-Pentane	QN	1,400E-03	QN	QV	QV	Q	Q
1-Pentene	2.950E-02	ON	2.091E-06	1.505E-06	6.828E-04	1.997E-08	5.690E-06
2-Methyl-1-butene	1.700E-02	QN	1.196E-06	8,609E-07	3.905E-04	1.142E-08	3.254E-06
n-Pentane	QN	1.200E-03	2	Q	2	2	Q
Isoprene	QN	1.000E-04	QN	QV	2	Q	Q
trans-2-Pentene	1.700E-02	QN	1.196E-06	8.609E-07	3.905E-04	1.142E-08	3.254E-06
cis-2-Pentene	QN	QN	QN	Q	2	Ð	Q
2-Methyl-2-butene	QN.	QN	ND	2	<u>Q</u>	Q	Q
2.2-Dimethylbutane	QV	2.500E-04	QN	ON	ON.	Q	Q.
Cyclopentene	QN	Q	QN	QN	QN	QN	Q
4-Methyl-1-pentene	2	QN	QN	QN	ON	QV	S
Cyclopentane	Q	1.500E-04	QN	QN	QN	Q.	Q
2,3-Dimethylbutane	QN	3.000E-04	QN	QN	QN	Q	QN
cis-4-Methyl-2-pentene	QN	Q	2	Q	2	9	Q.
2-Methylpentane	QN	1.350E-03	Q	Q.	QQ	Q	Q

Table B-2: Air Modeling Output Data for Volatile Organic Compounds

	Measured Actual	Measured	Average	Average	Total Mass of Pollutant	Average Modeled	Pollutant
Compound	Concentration (mg/m³)	Concentration	Adjusted Emission Factor	Adjusted Emission Factor	Emitted Per Item (grams)	Concentration for One Item	for One Item
	»	(mg/m³)	(Ib/Ib NEW)	(lb/item)	•	(grams/m³)	(a/sec)
3-Methylpentane	CIV	7 FOOE 04	9	4	Σ	CONC	ER,
2-Methyl-1-pentene	2 2	#0-300C.	N S	ON!	QN	2	Ω
1-Hexene	2 8 50 5 00	2 4	ON LOST O	Q	QN	QN	ND
n-Hexane	3.030E-02	ON ISSUE	Z.590E-06	1.865E-06	8.457E-04	2.474E-08	7.048E-06
trans-2-Hexene	Q !	1.500E-03	Q	Q	ND	QN	Q
2-Mathyl 2-partons	Q.	Q	9	Q	ND	QN	2
Cis.2. Havana	QN	Q	Q	QN	QN	QN	2
Methylyclopentene	Q !	Q	Q	QN	QN	QN	S
2 4-Dimethylpentane	2	4.500E-04	Q	Q	GN	QN	QV
Benzena		Q	Ð	2	QN	NO ON	QN
Cyclobeyane	3.210E-01	1.450E-03	2.271E-05	1.635E-05	7.418E-03	2.170E-07	6.182E-05
2-Mathylhovana	Q.	4.000E-04	QN	QN	ND	Q	S
2 3-Dimethylogotopo	2	5.000E-04	Q	QN	QN	Q	Q.
2 Mothaboxes	2	2.500E-04	Q	NO.	QN	Q	2
2-Metrylitexarie	2	8.000E-04	QN	QN	QV	Q.	Q
4,4,4-11IIIouijyipaniane	2	5.500E-04	QN	QN	QN	2	QN
II-neptalle	2	7.000E-04	QN	Q	QN	Q	S
7,4,4-1 rimetnyl-1-pentene	Q.	QN	QN	QN	QV	S	2
Mennylcycionexane	Q	5.500E-04	QN	Q	9	QN	S
2,4,4-1 rimethyl-2-pentene	QN	QN	S	QN	S.	S	2 2
7.5-Dimetnyinexane	Q	1.000E-04	QN ON	Q	Q.	Q	S
2,4-Dimetnyinexane	QN	1.000E-04	QN	QN	Q	Q.	S
2,9,4-1/imemylpentane Tolinoo		1.500E-04	QN	QN	QN.	2	9
2 Dimothylboxono	3.650E-02	2.950E-03	2.384E-06	1.716E-06	7.784E-04	2.277E-08	6.487E-06
2-Mathylbodane	Q.	1.000E-04	QV	QN	QN	S	Q
3-Fthylhaxana	Q	1.000E-04	Q	Q	QN	Q	Q
2.2-Dimethylhentane	ON C	1.500E-04	Q	Q	QN	QN	QN
2.2.4-Trimethylhaxana	Q.	Q.	Q	Q	QV	QN	Q.
n-Octane		ON TOOL	Q	Q	Q	QN	QV
Ethylovolohexane	ON S	1.500E-04	2	Q	QN	QN	Q
Ethylbenzene	ON LOS	QN	Q	QV	QN	QV	S
m-Xvlene & n-Xvlene	2.250E-02	1.035E-02	8.641E-07	6.221E-07	2.822E-04	8.255E-09	2.352E-06
Styrene	1.200E-01	4.270E-02	5.498E-06	3.959E-06	1.796E-03	5.253E-08	1.496E-05
0-Xylene	ON O	Q.	Q	Q	ND	QN	ND
-Nonane	2.100E-02	1.390E-02	5.046E-07	3.633E-07	1.648E-04	4.821E-09	1.373E-06
-Pronytheozene	Q.	Q	Q	Q	ON	ΩN	S
	QN	Q	2	QN	QN	Q	QV.

Table B-2: Air Modeling Output Data for Volatile Organic Compounds

		2, 14 60				Average	1
		Measured	Average	Average	Total Mass of Pollutant	Modeled	Foliotant Emission Rate
Panoamo	Measured Actual Concentration	Background	Adjusted	Adjusted	Emitted Per Item	Concentration for One Item	for One Item
	(mg/m ₃)	Concentration (mo/m³)	Emission Factor (Ib/Ib NEW)	Emission Factor (lb/item)	(Bidills)	(grams/m³)	(a/sec)
		Ď			M	CONC	ER,
Brown/honzone	Q	1.000E-04	QN	QN	QN	QN	QN
Frightiene	Q	QV.	QN	Q	QN	QN	QN
p-Entylloneine m-Ethyltoliene	Q	2.000E-04	QN	QN	QN	ON	QN
1 3 6 Trimethylbenzene	Q	2.000E-04	QN	2	QN	QN	S
C.Ethyllone	2	QN	QN	QN	QN	QN	QN
1.2 4-Trimethylbenzene & sec-Butylbenzene	QN.	4.500E-04	QN	QN	QN	QN	QN
n-Decane	2.050E-02	QN QN	1.458E-06	1.050E-06	4.761E-04	1.393E-08	3.967E-08
alpha-Pinene	2	QN	QN	QN	QN	Q	QN
heta-Dinana	Q.	QN	S	QV	QN	QN	Q
delta 3.Carene	Q.	QN	QN	QN	QN	QN	Q.
define of care	QV	QN	QV	2	QN	QN	S O
MTRE	QN	4.500E-04	QN	QN	QN	ND	QN.
Dichlorodiffioromethane	5.631E-03	2.557E-03	2.202E-07	1.586E-07	7.193E-05	2.104E-09	5.994E-07
Methylchloride	QN	QN	S	QN	QN	QN	N O
Dichlorotatraflionoethane	2	9.179E-04	S	QN.	QN .	ND	QN
Chloroethene	4.006E-02	QN	2.848E-06	2.050E-06	9.301E-04	2.721E-08	7.751E-06
1.3-Butadlene	1.526E-03	QN.	1.080E-07	7.779E-08	3.529E-05	1.032E-09	2.940E-07
Methylbromide	S	Q	QN.	QN	ND	NO	2
Ethylchloride	2.959E-03	QN	2.096E-07	1.509E-07	6.846E-05	2.003E-09	5.705E-07
Trichloromonofluoromethane	2.416E-03	2.577E-03	QN	QN	QN	Q	2
Vinvildenechloride	7.841E-03	Q	5.566E-07	4.007E-07	1.818E-04	5.317E-09	1.515E-06
Methylenechloride	4.834E-02	1.560E-03	3.321E-06	2.391E-06	1.085E-03	3.173E-08	9.039E-06
Allvichloride	Q	2	QN	QN	QN	ND	2
1.1.2-Trichloro-1,2,2-trifluoroethane	6.364E-04	.8.293E-04	QN	QN	QN	ON	Q
1,1-Dichloroethane	QN	QN	QN	QN	QN	Q	Ω
1,2-Dichloroethene	9.459E-03	ON	6.723E-07	4.841E-07	2.196E-04	6.423E-09	1.830E-06
Chloroform	2.605E-01	QN	1.849E-05	1.331E-05	6.039E-03	1.767E-07	5.033E-05
1,2-Dichloroethane	QN	ON	QN	QN	Q	2	Q
Methylchloroform	QN	2.960E-04	QN	Q	Q	Q	Q
Benzene	3,265E-01	1.475E-03	2.310E-05	1.663E-05	7.545E-03	2.207E-07	6.288E-05
Carbontetrachloride	1.109E-02	7.544E-04	7.346E-07	5.289E-07	2.399E-04	7.018E-09	1.999E-06
1,2-Dichloropropane	QN	QN	QN	Q	QN	Q	S
Trichloroethylene	8.613E-03	ΩN	6.123E-07	4.408E-07	2,000E-04	5.849E-09	1.666E-06
cis 1,3-Dichloro-1-propene	QN	QN	QN	Q	Q	S S	Q
frans 1,3-Dichloro-1-propene	2	Q.	Q	Q	QN	Q	Ω
1,1,2-Trichloroethane	QN	QN	QV	ND	QN	QN	Ω

Table B-2: Air Modeling Output Data for Volatile Organic Compounds

2.424E-06 1.746E-06 7.918E-04 CONC ND ND N	Compound	Measured Actual Concentration (mg/m³)	Measured Background Concentration (mg/m³)	Average Adjusted Emission Factor (ib/ib NEW)	Average Adjusted Emission Factor (lb/item)	Total Mass of Pollutant Emitted Per Item (grams)	Average Modeled Concentration for One Item	Pollutant Emission Rate for One Item (g/sec)
NITE-02 3.001E-03 1.74E-06 1.74E-06 1.74E-06 1.74E-06 1.75TE-07 1.71E-02 1.74E-07 1.75TE-09					B 10 - 1, sec	Σ	CONC	ER,
1,318E-02	Toluene	3.712E-02	3.001E-03	2.424E-06	1.746E-06	7.918E-04	2.316E-08	6,598E-06
1318E-02	1,z-Dibromoetnane	Q.	QN	ON .	ON	QV	2	9
2.47E-G2 ND 1.787E-G9 1.26F-G9 5.33E-G4 1.679E-G9 1.27E-G1 4.34SE-G2 1.587E-G9 4.025E-G9 4.33SE-G4 1.679E-G9 ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND	Perchioroethylene	1.319E-02	7.490E-04	8.826E-07	6.355E-07	2.882E-04	8.432E-09	2.402E-06
3445E-02 1,589E-02 1,589E-04 1,050E-06 1,835E-04 1,207E-09 1,207	Chlorobenzene	2.471E-02	QN	1.757E-06	1.265E-06	5.739E-04	1.679E-08	4.782E-06
1,221E-01	Ethylbenzene	3.454E-02	1.589E-02	1.327E-06	9.552E-07	4.333E-04	1.267E-08	3.610E-06
ND	m&p-Xylene	1.221E-01	4.343E-02	5.592E-06	4.026E-06	1.826E-03	5.342E-08	1 522F-05
ND	Styrene	QN	QN	QN	S	QV.	Q	CN
2.138E-02 1.414E-02 5.133E-07 3.636E-07 1.676E-04 4.904E-09 ND N	1,1,2,2-1 etrachloroethane	QN	QN	QN	QN	QN	Q	S
ND ND<	o-Xylene	2.136E-02	1.414E-02	5.133E-07	3.696E-07	1.676E-04	4.904E-09	1 397F-06
ND ND<	p-Ethyltoluene	QN	QN	QN	QN	ND	QV	QN
ND 4,577E-04 ND 1,137E-07 6,142E-05 1,495E-09	1,3,5-Trimethylbenzene	QN	QN	QN	QN	QN	QN	CX
ND 1,127E-07 5,112E-05 1,485E-09 1,485E-09 1,485E-09 1,485E-09 1,485E-09 1,485E-09 1,685E-04 1,681E-05 1,691E-06 1,691E-04 1,691E-09 1	1,2,4-Irimethylbenzene	QN	4.577E-04	QN	QN	QN	2	QN
2.205E-03 ND 1,565E-07 1,127E-07 5,112E-05 1,495E-09 1.502E-03 ND 1,131E-07 8,144E-08 3,694E-05 1,081E-09 1.007E-03 ND 7,229E-08 1,266E-04 1,537E-08 1,081E-09 2.451E-02 ND 1,485E-06 1,566E-04 1,537E-08 1,081E-05 2.64E-02 ND 1,485E-06 1,566E-04 1,609E-06 1,085E-06 2.054E-02 ND 1,485E-06 1,056E-04 1,609E-08 1,609E-06 5.88E-02 ND 1,485E-06 1,056E-06 4,786E-04 1,609E-08 5.88E-02 ND 1,465E-06 1,656E-06 1,386E-03 3,99E-08 6.789E-02 2,618E-04 4,692E-06 1,464E-06 6,43E-04 1,409E-08 1.903E-02 1,090E-03 ND 1,236E-06 1,536E-03 3,99E-03 1,409E-06 1.706E-02 ND 1,282E-06 1,586E-03 1,409E-06 1,409E-06 2.594E-02 2,153E-03 2,153E-03	Benzylchioride	S	QN	S	S	S	QN	CZ
1.592E-03 ND 1,131E-07 8,144E-08 3,694E-05 1,081E-09 1,081E-09 2.263E-02 ND 1,740E-08 1,159E-06 5,266E-04 1,537E-06 1,537E-08 1,537E-08 1,537E-08 1,537E-09 1,147E-09	in-Dichlorbenzene	2.205E-03	QN	1.565E-07	1.127E-07	5.112E-05	1.495E-09	4.260E-07
2.263E-02 ND 1,609E-06 1,159E-06 5.205E-04 1,537E-08 1.007E-03 ND 7,229E-08 5,205E-06 2,361E-05 6,907E-10 2.054E-02 ND 1,747E-06 1,256E-06 5,706E-04 1,609E-06 2.054E-02 ND 1,445E-06 1,656E-06 4,785E-04 1,609E-08 2.856E-02 ND 1,465E-06 1,656E-06 1,306E-03 1,400E-08 5.789E-02 ND 1,203E-06 1,465E-06 1,336E-04 1,400E-08 1.7903E-02 2,618E-04 4,092E-06 1,4420E-04 1,348E-04 1,400E-08 1.708E-02 ND 1,220E-06 8,738E-05 1,746E-03 3,908E-08 1.708E-02 ND 1,220E-06 8,738E-04 1,766E-08 1,766E-08 1.708E-02 ND 1,808E-06 1,341E-06 6,643E-04 1,166E-08 1.708E-01 ND ND ND ND ND 1.702E-01 ND 1,2376E-06 3,808E-07 1,767E-01 <td< td=""><td>p-Dichlorobenzene</td><td>1.592E-03</td><td>QN</td><td>1.131E-07</td><td>8.144E-08</td><td>3.694E-05</td><td>1.081E-09</td><td>3.078F-07</td></td<>	p-Dichlorobenzene	1.592E-03	QN	1.131E-07	8.144E-08	3.694E-05	1.081E-09	3.078F-07
1,007E-03 ND 7,229E-08 5,205E-08 2,361E-05 6,907E-10 2,451E-02 ND 1,47E-06 1,258E-06 5,706E-04 1,609E-08 2,054E-02 ND 1,465E-06 1,056E-06 4,765E-04 1,000E-08 5,582E-03 7,040E-03 ND 1,464E-06 6,643E-04 1,000E-08 5,582E-02 ND 2,034E-06 1,464E-06 6,643E-04 1,000E-08 6,582E-02 ND 1,200E-02 2,946E-06 1,335E-03 3,996E-03 1,003E-02 ND 1,220E-06 8,784E-07 3,946E-04 1,593E-08 1,792E-02 2,153E-03 5,384E-06 8,784E-07 3,946E-04 1,165E-08 ND ND 1,220E-06 8,784E-06 1,766E-03 5,144E-08 2,594E-02 ND 1,862E-06 1,346E-06 1,766E-03 5,144E-08 2,594E-02 ND 1,802E-06 1,361E-06 1,779E-03 1,156E-08 1,702E-01 ND 1,20E-06 1,361E-06 1,376E-06<	o-Dichiorobenzene	2.263E-02	QN	1.609E-06	1.159E-06	5.256E-04	1.537E-08	4.380E-06
2.45TE-02 ND 1.747E-06 1.258E-06 5.706E-04 1.669E-08 2.054E-02 ND 1.465E-06 1.055E-06 4.785E-04 1.400E-08 2.054E-02 ND 1.465E-06 1.055E-06 4.785E-04 1.400E-08 2.856E-02 ND 2.034E-06 2.046E-06 1.365E-03 3.908E-08 1.903E-02 ND 1.353E-06 9.744E-07 4.420E-04 1.503E-08 1.702E-02 ND 1.353E-06 9.744E-07 4.420E-04 1.165E-08 7.792E-02 2.183E-03 5.384E-06 3.877E-06 1.76E-03 5.144E-08 ND ND ND ND ND ND ND ND ND ND ND ND ND ND 4.615E-01 ND 1.738E-05 2.361E-05 1.643E-04 1.708E-08 A.516E-02 ND ND 1.625E-04 1.669E-06 1.707E-01 1.707E-03 A.517E-04 1.778E-03 1.767E-05 3.623E-04 1.645	i,z,4-i ricniorobenzene	1.007E-03	QN	7.229E-08	5.205E-08	2.361E-05	6.907E-10	1 968F-07
2.054E-02 ND 1.465E-06 1.055E-06 4.785E-04 1.400E-08 1.400E-08 5.58ZE-03 7.040E-03 ND ND ND ND ND 2.858E-02 ND 2.034E-06 1.464E-06 6.643E-04 1.943E-08 1.943E-08 1.903E-02 ND 1.353E-06 2.346E-06 1.336E-03 3.909E-08 1.706E-02 ND 1.220E-06 8.783E-07 4.420E-04 1.535E-08 2.594E-02 ND 1.220E-06 8.783E-07 4.420E-04 1.759E-08 ND ND 1.862E-06 1.341E-06 1.758E-03 5.144E-08 ND ND 1.862E-06 1.361E-04 1.779E-08 1.779E-08 ND ND 1.231E-05 2.361E-05 1.779E-03 1.739E-08 A 615E-01 ND 1.213E-05 2.361E-05 3.960E-03 1.582E-07 1.304E-02 ND 1.514E-06 1.643E-04 1.542E-08 1.542E-08 2.206E-02 ND 1.514E-06 1.6	Hexacriorobutadiene	2.451E-02	QN	1.747E-06	1.258E-06	5.706E-04	1.669E-08	4.755E-06
5.582E-03 7.040E-03 ND ND ND 2.856E-02 ND 2.034E-06 1.464E-06 6.643E-04 1.943E-08 5.789E-02 2.616E-04 4.092E-06 2.946E-06 1.336E-03 3.909E-08 1.903E-02 ND 1.553E-06 9.744E-07 4.420E-04 1.293E-08 1.716E-02 ND 1.220E-06 8.783E-07 3.94E-04 1.165E-08 1.716E-02 ND 1.862E-06 1.341E-06 1.756E-03 5.144E-08 2.594E-02 ND ND ND ND ND A.615E-01 ND ND ND ND ND 1.702E-01 ND 1.213E-05 2.361E-05 3.860E-03 3.135E-07 1.702E-01 ND 1.614E-06 1.643E-01 1.779E-02 3.135E-07 1.304E-02 ND 1.614E-06 1.62E-06 3.860E-03 3.136E-05 1.334E-02 ND 1.614E-06 1.62E-06 3.860E-03 3.136E-03 1.934E-02 N	Prienylacetylene	2.054E-02	Q	1.465E-06	1.055E-06	4.785E-04	1.400E-08	3.987E-06
2.856E-02 ND 2.034E-06 1.464E-06 6.643E-04 1.943E-08 1.945E-08 1.946E-08 1.945E-08 1.946E-09 1.946E-03 1.948E-08 1.943E-08 1.946E-03 1.946E-08 1.946E-08 1.946E-08 1.946E-08 1.946E-08 1.946E-08 1.946E-08 1.946E-09 1.946E-09 1.220E-09 8.784E-07 4.420E-04 1.263E-08 1.146E-08 1.146	d-Limonene Math. 12	5.582E-03	7.040E-03	ON	QN	QN	2	Q
5.789E-02 2.618E-04 4.092E-06 2.946E-05 1.336E-03 3.909E-08 1.903E-02 ND 1.353E-06 9.744E-07 4.420E-04 1.293E-08 1.70E-02 ND 1.220E-06 8.783E-07 3.984E-04 1.165E-08 7.79ZE-02 2.153E-03 5.384E-06 3.877E-06 1.758E-03 5.144E-08 ND ND ND ND ND ND ND 7.08E-02 2.153E-03 5.384E-06 1.341E-06 6.081E-04 1.779E-08 ND ND ND ND ND ND ND 7.08E-02 ND ND ND ND ND ND 4.615E-01 ND 1.213E-05 2.361E-05 1.071E-02 3.138E-07 1.70ZE-01 ND 1.614E-06 1.162E-06 5.272E-04 1.58E-07 1.934E-02 ND 1.787E-05 1.287E-05 5.837E-04 1.509E-08 1.934E-02 ND ND ND ND ND <	Metriyiniride Acctociteic	2.856E-02	S	2.034E-06	1.464E-06	6.643E-04	1.943E-08	5.536E-06
1,903E-02 ND 1,353E-06 9,744E-07 4,420E-04 1,293E-08 1,716E-02 ND 1,220E-06 8,783E-07 3,984E-04 1,165E-08 7,792E-02 2,153E-03 5,384E-06 3,877E-06 1,758E-03 5,144E-08 2,594E-02 ND ND ND ND ND ND 7,085E+00 2,237E-03 5,032E-04 3,633E-04 1,643E-01 4,807E-06 7,085E+00 2,237E-03 5,032E-04 3,633E-04 1,643E-01 4,807E-06 4,615E-01 ND 1,218E-05 2,361E-05 3,806E-03 1,158E-07 1,702E-02 ND 1,614E-06 1,162E-06 3,806E-03 1,542E-08 1,934E-02 ND 1,370E-06 9,865E-07 4,475E-04 1,542E-08 ND ND 1,370E-06 9,865E-07 4,475E-04 1,507E-07 ND ND ND ND ND ND ND ND ND ND ND ND <td< td=""><td>Acetonitrie</td><td>5.789E-02</td><td>2.618E-04</td><td>4.092E-06</td><td>2.846E-06</td><td>1.336E-03</td><td>3.909E-08</td><td>1.114E-05</td></td<>	Acetonitrie	5.789E-02	2.618E-04	4.092E-06	2.846E-06	1.336E-03	3.909E-08	1.114E-05
1.716E-02 ND 1.220E-06 8.783E-07 3.984E-04 1.165E-08 7.792E-02 2.153E-03 5.384E-06 3.877E-06 1.758E-03 5.144E-08 2.594E-02 ND 1.862E-06 1.341E-06 6.081E-04 1.779E-08 ND ND ND ND ND ND 7.085E+00 2.237E-03 5.032E-04 3.632E-04 1.643E-01 ND 4.615E-01 ND 1.213E-05 2.361E-05 1.071E-02 3.133E-07 1.702E-01 ND 1.614E-06 1.62E-06 3.960E-03 1.158E-07 2.276E-02 ND 1.614E-06 1.62E-06 5.272E-04 1.542E-08 1.934E-02 ND 1.787E-05 1.287E-05 1.707E-04 1.509E-08 ND ND 1.787E-05 1.287E-06 5.837E-04 1.707E-08 ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND	Nitomothana	1.903E-02	Q	1.353E-06	9.744E-07	4.420E-04	1.293E-08	3.683E-06
7.92E-02 2.153E-03 5.384E-06 3.877E-06 1.758E-03 5.144E-08 2.594E-02 ND 1.862E-06 1.341E-06 6.081E-04 1.779E-08 ND ND ND ND ND 7.085E+00 2.237E-03 5.032E-04 3.623E-04 1.643E-01 ND 4.615E-01 ND 1.213E-05 8.730E-06 3.960E-03 1.158E-07 1.702E-01 ND 1.614E-06 1.62E-06 5.272E-04 1.542E-08 1.934E-02 ND 1.370E-06 9.865E-07 4.475E-04 1.509E-08 ND ND 1.787E-05 1.287E-06 5.837E-04 1.707E-07 ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND	Renzonitrile	1.716E-02	Q	1.220E-06	8.783E-07.	3.984E-04	1.165E-08	3.320E-06
A.594E-02 ND 1.862E-06 1.341E-06 6.081E-04 1.779E-08 ND ND ND ND ND ND 7.085E+00 2.237E-03 5.032E-04 3.623E-04 1.643E-01 4.807E-06 4.615E-01 ND 1.213E-05 2.361E-05 1.071E-02 3.133E-07 1.702E-01 ND 1.614E-06 1.162E-06 5.272E-04 1.542E-08 1.934E-02 ND 1.370E-06 9.865E-07 4.475E-04 1.309E-08 ND ND ND ND ND ND ND ND ND ND ND	Nitrohenzene	7.792E-02	2.153E-03	5.384E-06	3.877E-06	1.758E-03	5.144E-08	1.465E-05
ND ND ND ND ND 7.085E+00 2.237E-03 5.032E-04 3.623E-04 1.643E-01 4.807E-06 4.615E-01 ND 3.278E-05 2.361E-05 1.071E-02 3.133E-07 1.702E-01 ND 1.213E-05 8.730E-06 3.960E-03 1.158E-07 2.276E-02 ND 1.614E-06 1.162E-06 5.272E-04 1.542E-08 1.934E-02 ND 1.787E-05 9.865E-07 4.475E-04 1.309E-08 ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND	4-Methylhenzonitrile		ON!	1.862E-06	1.341E-06	6.081E-04	1.779E-08	5.068E-06
7.085E+00 2.237E-03 5.032E-04 3.623E-04 1.643E-01 4.807E-06 4.615E-01 ND 3.278E-05 2.361E-05 1.071E-02 3.133E-07 2.276E-02 ND 1.213E-05 8.730E-06 3.960E-03 1.158E-07 1.934E-02 ND 1.614E-06 1.162E-06 5.272E-04 1.542E-08 ND ND 1.370E-06 9.865E-07 4.475E-04 1.309E-08 ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND	Carbon Disulfide	NO. L	QN ISS	QN	Q	QN	QN	ND
4.01be-01 ND 3.278E-05 2.361E-05 1.071E-02 3.133E-07 1.702E-01 ND 1.213E-05 8.730E-06 3.960E-03 1.158E-07 2.276E-02 ND 1.614E-06 1.162E-06 5.272E-04 1.542E-08 1.934E-02 ND 1.370E-06 9.865E-07 4.475E-04 1.309E-08 ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND	Thionhana	,000E+00	2.23/E-U3	5.032E-04	3.623E-04	1.643E-01	4.807E-06	1.369E-03
1.70ZE-01 ND 1.213E-05 8.730E-06 3.960E-03 1.158E-07 2.276E-02 ND 1.614E-06 1.162E-06 5.272E-04 1.542E-08 1.934E-02 ND 1.370E-06 9.865E-07 4.475E-04 1.309E-08 2.521E-01 ND ND 1.787E-05 1.287E-05 5.837E-03 1.707E-07 ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND	Dimethyldisulfide	4.015E-01	2	3.279E-05	2.361E-05	1.071E-02	3.133E-07	8.924E-05
2.2 / De-102 ND 1.614E-06 1.162E-06 5.272E-04 1.542E-08 1.934E-02 ND 1.370E-06 9.865E-07 4.475E-04 1.309E-08 2.521E-01 ND ND 1.707E-05 1.287E-05 5.837E-03 1.707E-07 ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND ND	2-Mathylthionene	1.70ZE-01	Q !	1.213E-05	8.730E-06	3.960E-03	1.158E-07	3.300E-05
1.954E-02 ND 1.370E-06 9.865E-07 4.475E-04 1.309E-08 2.521E-01 ND 1.787E-05 1.287E-05 5.837E-03 1.707E-07 ND	3-Methylthionbene	2.276E-02	Q	1.614E-06	1.162E-06	5.272E-04	1.542E-08	4.393E-06
2.521E-01 ND 1.787E-05 5.837E-03 1.707E-07 ND	Dimethylfriculfide	1.934E-02	Q	1.370E-06	9.865E-07	4.475E-04	1.309E-08	3.729E-06
QN QN QN QN QN QN QN QN QN QN	1-Chlorobutano	2.521E-01	Q	1.787E-05	1.287E-05	5.837E-03	1.707E-07	4.864E-05
ON ON ON ON ON ON ON	1-Bromo-2-chloroethano	2	Q	S	Q	QN	QN	S
ON ON ON ON	2-Bromo-1-chlorogogo	ON:	Q	Ω	Q	QN	QN	Q
	z-promo-1-cimoropiopane	Q	Q	QN	QN	QN	Q	QN

Table B-2: Air Modeling Output Data for Volatile Organic Compounds

The second control of							
Compound	Measured Actual Concentration	Measured Background	Average Adjusted	Average Adjusted	Total Mass of Pollutant Emitted Per Item	Average Modeled Concentration for	Pollutant Emission Rate for One Item
	(mg/m³)	(mg/m³)	(Ib/Ib NEW)	(lb/item)	(grams)	(grams/m³)	(d/sec)
					M	CONC	ER,
1,2-Dichlorobutane	ND	ND	ND	QN	QN	ND	QN
1,2,3-Trichloropropane	ND	ND	ND	QN	QN	QN ON	QN
1-Chloro-2-methylbenzene	1.901E+00	ND	1.354E-04	9.748E-05	4.422E-02	1.293E-06	3.685E-04
1-Chloro-3-methylbenzene	1.564E-01	QN	1.115E-05	8.026E-06	3.640E-03	1.065E-07	3.034E-05
1-Chloro-4-ethylbenzene	QN	ND	ND	ON	QN	ON	Q.
Pentachloro-1-propene	QN	QN	QN	QN	ON	ND	QN
Hexachloroethane	1.317E-02	QN	9.261E-07	6.668E-07	3.024E-04	8.848E-09	2.520E-06
1,2-Dichloro-3-methylbenzene	ND	QN	QN	ON	ON	ND	QN.
Carbonyl Sulfide	6.600E-02	QN	4.691E-06	3.378E-06	1.532E-03	4.482E-08	1.277E-05
Trichloroacetonitrile	Q	QN	QN	QN	QN	ND	QN
Dichloroacetonitrile	2.291E-02	QN	1.629E-06	1.173E-06	5.320E-04	1.556E-08	4.434E-06
Isothiocyanatomethane	1.237E-01	QN	8.784E-06	6.324E-06	2.869E-03	8.392E-08	2.391E-05
1,1-Dichloro-2-propanone	S	QN	QN	QN	QN	ND	QN
2-Thiophenecarboxaldehyde	2.243E-02	1.311E-03	1.554E-06	1.119E-06	5.074E-04	1.484E-08	4.228E-06
Acetaldehyde	8.927E-01	QN	6.348E-05	4.571E-05	2.073E-02	6.065E-07	1.728E-04
Ethanol	1.864E-02	7.082E-04	1.269E-06	9.139E-07	4.145E-04	1.213E-08	3.454E-06
Acrolein	5.075E-01	8.406E-04	3.625E-05	2.610E-05	1.184E-02	3.463E-07	9.865E-05
Acetone	2.148E+00	4.208E-01	1.224E-04	8.813E-05	3.998E-02	1.169E-06	3.331E-04
Propanal	ON	QN	QN	QN	QN	Q	ΩN
Furan	1.275E-01	QN	9.057E-06	6.521E-06	2.958E-03	8.653E-08	2.465E-05
2-Propanol	8.166E-03	4.501E-03	2.613E-07	1.882E-07	8.534E-05	2.497E-09	7.112E-07
Methacrolein	4.207E-02	QN	2.993E-06	2.155E-06	9.775E-04	2.860E-08	8.146E-06
MTBE	QN	8.996E-04	QN	QN	QN	Q	Q
Methyl-vinyl ketone	8.345E-02	1.724E-04	5.956E-06	4.288E-06	1.945E-03	5.690E-08	1.621E-05
2,3-Butanedione	1.547E-01	QN	1.102E-05	7.931E-06	3.597E-03	1.052E-07	2.998E-05
Butanal	2.649E-02	3.930E-04	1.857E-06	1.337E-06	6.063E-04	1.774E-08	5.053E-06
2-Butanone	7.521E-02	6.697E-03	4.865E-06	3.503E-06	1.589E-03	4.648E-08	1.324E-05
2-Methylfuran	7.434E-03	QN	5.229E-07	3.765E-07	1.708E-04	4.995E-09	1.423E-06
3-Methylfuran	Q.	Q	Q.	Q	Q.	Q	Q
trans-2-Butenal	1.364E-01	QN	9.746E-06	7.017E-06	3.183E-03	9.311E-08	2.652E-05
Tetrahydrofuran	QN	1.444E-03	QN	QN	QN	QN	ND
3-Methyl-2-butanone	QN	QN	QN	QN	QN	Q.	QN
Acetic Acid	1.570E-02	4.931E-04	1.087E-06	7.828E-07	3.551E-04	1.039E-08	2.959E-06
1-Butanol	1.697E-02	8.710E-04	1.144E-06	8.237E-07	3.736E-04	1.093E-08	3.113E-06
1-Penten-3-one	Q	Q	Q	Q	QN	Q	Q
2-Pentanone	9.176E-03	QN	6.502E-07	4.682E-07	2.124E-04	6.212E-09	1.770E-06

Table B-2: Air Modeling Output Data for Volatile Organic Compounds

Compound	Measured Actual Concentration (mg/m³)	Measured Background Concentration (mg/m³)	Average Adjusted Emission Factor (ib/ib NEW)	Average Adjusted Emission Factor (lb/ltem)	Total Mass of Pollutant Emitted Per Item (grams)	Average Modeled Concentration for One Item (grams/m³)	Pollutant Emission Rate for One Item (g/sec)
Pentanal	QN	CN	CN	C Z	Σ	CONC	ER
2.3-Pentanedione	QN	200	2 2	2 2	2 2	2	Q
1,2-Dichloro-2-methylpropane	QN	ND	Q	S S	2 2	2 2	2 5
3-Pentanone	QN	QN	QN ·	QN	QN	Q	QN
2.3-Dirnetnyiruran 1.Methyl 2 postanon	Q	9	QN	QN	QN	QN	Q.
rane 3 Douton 2 cm	1.909E-02	Q	1.357E-06	9.769E-07	4.431E-04	1.296E-08	3.693E-06
Judopatanona	QN	2	QN	QN	ND	QN	Q
2. Heyanopa	2	2	Q	QN	ND	Q.	P
- I sadiulia	Q	QN	Q	ON	QN	S	9
Texalial Secondary	2.998E-02	6.758E-04	2.089E-06	1.504E-06	6.823E-04	1.996E-08	5.686E-06
2 Cyclosconton 4 con	1.143E-01	3.472E-04	8.105E-06	5.835E-06	2.647E-03	7.743E-08	2.206E-05
	Q	2	QN	QN	QN	QN.	2
Applications	3.019E-01	1.711E-03	2.134E-05	1.536E-05	6.969E-03	2.039E-07	5.808E-05
-Acetoxyacetone	Q	Q	QN	QV.	QN	P	Q
- nepignone Jantanal		Q	2.691E-07	1.938E-07	8.789E-05	2.571E-09	7.324E-07
	8.146E-03	7.655E-04	5.249E-07	3.780E-07	1.714E-04	5.015E-09	1.429E-06
Benzaldehyde	1 140F 04	ND 1 6001	QN .	2	QN	QN	NO
Benzofiran	1.1486-01	1.603E-03	8.074E-06	5.814E-06	2.637E-03	7.714E-08	2.197E-05
Octanal	3.352E-02	Q	2.382E-06	1.715E-06	7.779E-04	2.276E-08	6.483E-06
Coctoshoposo	1.166E-02	1.216E-03	7.427E-07	5.347E-07	2.425E-04	7.095E-09	2.021E-06
Mossess	Q	QN	QN	QN	QN	2	Q
- NOTIGITORIE	Q	Q	QN	Q	S	Q	CZ
Vollaria	1.010E-02	7.861E-04	6.637E-07	4.778E-07	2.167E-04	6.340E-09	1.806E-06
oomotes: ID ≈ Not Detected							

ND = Not Detected NEW = Net Explosive Weight

Items in bold represent duplicate values for those compounds that are common for Method TO-14 and TO-12.

		Red Smoke Grenade	Grenade		Number of Items (I)	-	1 Itom
		NEW. Ib	= 0.72		Release duration (t)	120	120 caronde
		Number of Items	Items = 1		Unit Concentration (UC):	3.51E-03	seconds o/m ³
					(00) (00)	20.5	9/10
	Measured	Measured		Average	Total Mass of Pollutant	Average Modeled	Pollutant
Compound	Actual	Background	·	Adjusted Emission	Emitted Per Item (grams)	One Item	for One Item
	(mg/m³)	(mg/m³)	Factor	Factor (Ih/item)	(2000)	(grams/m³)	(grams/sec)
			(ייישרוט ויישו)	(incilial)	M	CONC	ER,
Particulate/Vapor-phase SVOCs							
N-Nitrosodimethylamine	ND	ND	Q	Q	QN	S	QN
Pyridine	ND	QN	Q	Q.	QN	QN	QN
2-Picoline	QN	ON	QN	QN	QN	S	S
Methyl methanesulfonate	QN	QN	QN	9	S	ND ND	2
N-Nitrosomethylethylamine	QN	QN	QN	Q	ND	QN	QN
N-Nitrosodiethylamine	ND	ND	QN	QN	ON	QN	QN
Ethyl methanesulfonate	9	ON	QN	ND	QN	QN	QN
Phenol	Ð	Q	QN	ND	QN	QV	Q.
Aniline	2	Q.	QN	QN	ON	QN	QV
bis(2-Chloroethyl)ether	2	QN	QN	ΩN	- ON	QN	QN
Pentachloroethane	Ω	QN	QN	2	ND	QN	QN
2-Chlorophenol	2	Q	Q	Q	ND	QN	QN
1,3-Dichlorobenzene	ND.	Q	QN	Q	ND	QN	QN.
1,4-Dichlorobenzene	Q	ÖN	Q	ON.	ND	QN	Q
Benzyl alcohol	Q	Q.	ND	ON	QN	Q	Q
2-Methylphenol	۵	ON	QN	Q	ON	QN	Q.
1,2-Dichlorobenzene	2	ON.	ΩN	QN	. ND	ND	Q
bis(2-Chloroisopropyi)ether	Q	Q	S	QN	ON	QN	9
o-Toluidine	2	QN	Q	ON	ND	QN	Q.
4-Methylphenol/3-Methylphenol	Q	QN	Q	Q.	ND	QN	QN.
N-Nitroso-di-n-propylamine	Q	ND	Q	Q	ND	QN	Q
Acetophenone	2	3.435E-03	Q.	2	ND	ND	Q
N-Nitrosomorpholine	Q	QN	Q	2	ND	QN	QN
N-Nitrosopyrrolidine	2	Q	Q.	Q.	ND	Q.	Q
Hexachloroethane	2	QN	S	QN	ND	2	Q
Nitrobenzene	Q.	QN	QN.	QN	ND	QN	2
N-Nitrosopiperidine	Ð	QN	QN	Q.	ND	QV	Q.
Isophorone	2	QN	Q	QN	ND	QV	2
2,4-Dimethylphenol	2	QN	2	2	ND	ND	S
2-Nitrophenol	9	Ω	Q	Q.	ND	QN	QN
bis(2-Chloroethoxy)methane	Q	2	2	Q	QN	Q	Q

Table B-3: Air Modeling Output Data for Semi-Volatile Organic Compounds

Compound	Measured Actual Concentration (mg/m³)	Measured Background Concentration (mg/m³)	Average Adjusted Emission Factor (Ib/Ib NEW)	Average Adjusted Emission Factor (ib/item)	Total Mass of Pollutant Emitted Per Item (grams)	Average Modeled Concentration for One Item (grams/m³) CONC	Pollutant Emission Rate for One Item (grams/sec) ER,
Benzoic acid	QN	QN	QN	Q	QN	Q	CN
2,4-Dichlorophenol	QN	QN.	QN	QN	QN	Q	Q
1,2,4-Trichlorobenzene	QN	QN	QN	Q	S	2	QV
Naphthalene	QN	S	QN	Q	S	2	QN
p-Chloroaniline	QN	QN	ON	Q	QN.	2	Q.
2,6-Dichlorophenol	QN	QN	QN	QN	QN	Q	Q
Hexachloropropene	Q	QN	ON	ND.	QN	Q	Q
Hexachlorobutadiene	2	Q	QN	ND	QN	Q	Q.
Dimetnyiphenethylamine	2	ΩN	QN	ND	QN	Q	Q
N-Nitroso-di-n-butylamine	Q	2	ON	QN	QN	g	QN
4-Chloro-3-methylphenol	Q	Q	ON	ND	QV	9	QN
Safrole	QN	ND	ND	QN	QN	Q	2
2-Methylnaphthalene	Q	QN	ON	QN	QN	Q	Q
1,2,4,5-1 etrachlorobenzene	Q.	Q	ND	QN	QN	Q	Q.
Hexachlorocyclopentadiene	Q.	Q.	QN	QN	ON	Q	Q
2,4,0-1 richlorophenol	QN	9	QN	QN	QN	S	QN
2,4,5-Trichlorophenol	٩	QN	QN	QN	QN	Q	QN
isosairole	Q.	Q	ND	ND	QN	Q	S
Z-Cnioronaphthalene	QN	Q	ON	QN	ON	Q	N O
Z-Nitroaniline	Q	Q	Q	QN	, QN	S	QN
1,4-ivapntnoquinone	Q	Q	Q	QN	QN	S	S
Umemylphthalate	2	Q	Q	ND	ND	QN	2
S-Dinitropelizane	Q :	2	2	Q	QN	QN	ND
Acepsathtylene	QN S	2	Q	Ð	QN	ON	QN
2 Nitrocallia	ON!	Q	Q	Q	ND	ON -	Q
J-Initioaniine	Q.	Q	Q	Q.	ND	QN	QN
2.4 Distance	Q	9	Q	2	ND	QN ·	Q
z,+-Dinigiphenol	Q	Q	Q	QN	QN	QN	QN
Acertaphitiene 2.4 Distratel	Q	Q	S S	Ð	ND	QN	P
Oihonageine	2	2	9	9	ND	QN	Q
Dentachloroboxago	Q S	Q	2	2	ND	ON	QN
1 Noohthuloming	QN	Q	9	Q	QN	QN	Q
1-Naphrnylamine	Q	Ð	Q	QN	QN	QN	QN
2-yapınınylarınıne 2-3-4-6 Totoopheres	Q	Q	Q	Q	ON	QN	ND
z,3,4,0-1etrachiorophenol	Q	Q	Q	ND	QN	9	QV
						-	

Compound	Measured Actual Concentration (mg/m³)	Measured Background Concentration (mg/m³)	Average Adjusted Emission Factor (ib/lb NEW)	Average Adjusted Emission Factor (Ib/Item)	Total Mass of Pollutant Emitted Per Item (grams) M	Average Modeled Concentration for One Item (grams/m³) CONC	Pollutant Emission Rate for One Item (grams/sec) ER,
Diethylphthalate	QN	1.041E-03	QN	2	QN	ΩN	QN
4-Chlorophenylphenyl ether	QN	QN	QN	QN	QV	S	Q.
Fluorene	Q	QN	QN	QN	ON.	9	QN
5-Nitro-o-toluidine	QN	QN.	ND	QN	ON.	Q	S
4-Nitroaniline	QV.	Q.	QN	ND	QN	QV	Q
4,6-Dinitro-2-methylphenol	Q	QN	QN	ND	QN	S	QN
Diphenylamine/N-NitrosoDPA	ON	ON	QN	QN	QN	QN	QN
sym-Trinitrobenzene	QN ON	QN.	ND	QN	QN	QV	QN
Dialiate	Q	QN	ON	QN	QV	QV	QN
Phenacetin	QN	QN	QN	2	S	QN	QN
4-Bromophenylphenyl ether	QN	ON	QN	QN	QN	QN	S
Hexachlorobenzene	QN ND	5.860E-03	QN	Q.	QN	QN	Q.
4-Aminobiphenyl	QN	QN	QN	ND	DN	QN	QV.
Pronamide	QN	Ω	S	ND	QN	QN	QN
Pentachlorophenol	ON	QN	QN	ND	QN	QN	QN N
Pentachloronitrobenzene	Q	Q	N _O	NO	QN	QN	Q
Phenanthrene	Q	Q.	ON	NO	DN	QN	QN
Anthracene	QN	QN	QN	ND	QN	QN	Q
Carbazole	Q	Q	QN	ND	QN	QN	2
DI-n-butyiphthalate	Q	Q	ON.	NO	QN	QN	Q
4-Nitroquinoline-1-oxide	9	Q	Q	Q	QN	QN	Q
Methapyrilene	QN	Q.	Q	Q	QN	QN	QV
Fluoranthene	Q	Q	Q.	QN O	DN	QN	QN
Benzidine	Q	Q	Q	2	QN	QN	QN
Pyrene	QV	Q	Q	Q	QN	QN	QN
p-Dimethylaminoazobenzene	Q	9	Q	Q.	QN	QN	Q
Chlorobenzilate	Q	Q	S	S	QN	QN	QN
Kepone	Q	Q	QN	ND	ON	QN	S
Butylbenzylphthalate	S	2	Q	Q.	DN	QN	QV
3,3'-Dimethylbenzidine	QV	QN	2	ND	ON	QN .	Q
2-Acetylaminofluorene	Q	Q	2	ON.	QN	QV	9
bis(2-Ethylhexyl)phthalate	QN	1.124E-02	S.	QN	QN	QV	QN
3,3'-Dichlorobenzidine	2	Ω	Q.	Q.	ON	QN	S
Benz(a)anthracene	S	2	2	Q.	ON	QV	QV
Chrysene	Q	잎	QN.	ND	QN	S	QN

Table B-3: Air Modeling Output Data for Semi-Volatile Organic Compounds

Compound	Measured Actual Concentration (mg/m³)	Measured Background Concentration (mg/m³)	Average Adjusted Emission Factor (ib/ib NEW)	Average Adjusted Emission Factor (lb/item)	Total Mass of Pollutant Emitted Per Item (grams)	Average Modeled Concentration for One Item (grams/m³) CONC	Pollutant Emission Rate for One Item (grams/sec) ER,
Di-n-octylphthalate	QN	QN	QN	QN	QN.	S	QN ON
7,12-Dimethylbenz(a)anthracene	QN	QN	QN	QN	SP	QN	S
Benzo(b)fluoranthene	QN	QN	QN	2	S	9	9
Benzo(k)fluoranthene	QN	QN	DN	QN	QN	Q	QN
Benz(a)pyrene	QN	QN	DN	QN	ND	QN	QN
3-Methylcholanthrene	QN	QN	QN	QN	QN	9	Q
Indeno(1,2,3-cd)pyrene	QN	QN	QN	QN	QN	Q	QN
Dibenz(a,h)anthracene	QN	QN	QN	QN	QN	QN	QN
Benzo(g,h,i)perylene	QN	QN	ON	QN	QN	QN	QN Q
Particulate/Vapor-phase SVOCs (Tentatively Identified Compounds)	dentified Com	(spunod					
2-(2-quinolinyl)-(H-indene-1,3-(2H)-dione (a)	QN	QN	QN	QN	ND	Q	S
Benzanthrone (b)	QN	QN	QN	QN	Q	2	Q
Tetrachloroethene	QN	QN	QN	QN	QN	Q	Q
(1,2-dichloroethyl)-benzene	QN	- QN	QN	QN	ON	Ð	ΩN
4-phenoxy-2(1H)-quinolinone (a)	QN	ND	ON	QN	QN	Q	S
3-(phenylhydrazone)-1H-Indole-2,3-dione	1.264E+03	QN	8.581E-02	6.178E-02	2.802E+01	8.198E-04	2.335E-01
4-1,2,4-oxadizaolin-3-one-2,5-diphenyl-delta	ND	QN	ON	ON	ON	Q	QN
2-amino-9,10-anthracenedione (a)	5.192E+01	ND	3.526E-03	2.538E-03	1.151E+00	3.368E-05	9.595E-03
Footnotes:							
ND = Not Detected							
NEW = Net explosive Weight							

APPENDIX C

HEALTH-BASED SCREENING LEVELS AND ACUTE TOXICITY VALUES

Control Cont	1278-96-6 500E-01			MACUOIDON THE			2.7.2.2.2				-		
17.199-56-1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10.00-10.1 10	12.89-66-10	S. Cetoingsamille		1938	infortable	Kenjionika Kalaioa		Health based			3		WAGUTONICIEN
TAGE-01-01-01-01-01-01-01-01-01-01-01-01-01-	12/189-66-1 5.00E+01 NA C 5.00E+01 7/847-60-1 2.00E+01 NC 5.00E+01 NC 5.00E+01 7/847-60-2 2.00E+01 NC 5.00E+01 NC 5.00E+01 NC 5.00E+01 7/847-60-6 2.00E+01 NC 5.00E+01				Orino	34(h0/m))	(Control)	(w/g()					
T782-50-5 Z08E-01 DE Z08E-02 DE Z08E-02 Z08E-03 Z0	7/84/-01-0 2.08E+01 nc 2.08E+01 nc 2.08E+01 z.08E+01 z.20E+02 z.20E	101	12/89-66-1	5.00E+01		NA		5.00E+01	ΑN	NAN	NA	Stelled Market Service	7
TAG-50-6 Z08E-01 NA Z08E-02 Z08E-03 Z08E-03 Z08E-04	1/782-50-5 2.08E-01 nc 3.65E+02 nc 2.09E-01 2 1/786-08-6 1.57E-08 c 4.17E-08 c 4.48E-08 c 10024-37-2 1.00E+02 1.57E+02 2 0 4.48E-08 1.00E+02 10024-37-2 1.00E+01 nc 2.08E+01 nc 2.08E+01 nc 2.08E+01 nc 124-38-9 NA 3.65E+00 nc 2.08E+01 nc 2.08E+01 nc 140-38-0 NA 1.46E+00 nc 3.55E+00 nc 3.55E+00 1440-38-0 NA 1.46E+00 nc 1.47E-04 nc 1.46E+00 1440-41-7 8.00E-04 n 1.46E+00 nc 1.56E+00 nc 1.56E+00 1440-41-7 8.00E-04 n 1.56E-04 c 1.56E+00 nc 1.56E+00 1440-41-7 8.00E-04 n 1.56E-04 c 1.53E-01 nc 1.53E-01 1440-41-7 8.00E-04		/647-01-0	2.08E+01	nc	2.08E+01	uc	2.08E+01	Υ _Z	4.47F+03	AN	-	4 475 .00
1746-01-6 174E-02 C	1746-01-6 4.48E-08 C 4.17E-08 C 4.48E-08 E 630-692 E	, (1)	7782-50-5	2.09E-01	υc	3.65E+02	υC	2.09E-01		+-	9	- <	4.47E+U3
10024-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 10074-972 1007	630-08-0 157E+02	Dloxin TEQ	1746-01-6	4.48E-08	o	4.17E-08	U	4.48E-08		+-	i	< }	2.90E+03
10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 10024-97-2 100	10024-97-2 1,00E-02	Carbon Monoxide (CO)	630-08-0	1.57E+02		Ϋ́Α		1.57E+02	2 305 105			- 1	3.50E+00
7440-38-5 5.08E-01 0.0 0.08E-01 0.0 0.08E-01 0.0 0.08E-01 0.0 0.08E-01 0.0 0.08E-01 0.0 0.08E-01 0.08E-01 0.08E-01 0.08E-01 0.08E-01 0.08E-01 0.08E-01 0.08E-02 0.08E	7647-01-0 2.08E+01 nc 2.08E+01 nc 2.08E+01 7446-38-9 NA NA NA NA NA 7426-38-5 8.00E+01 NA 3.65E+00 nc 3.65E+00 7440-36-0 NA 1.46E+00 nc 1.46E+00 nc 1.46E+00 7440-38-2 4.47E-04 c 4.15E-04 c 4.47E-04 d 4.47E-04 7440-38-3 5.21E-01 nc 5.21E-01 nc 4.47E-04 d 4.47E-04 7440-41-7 8.00E-04 c 7.45E-04 c 1.50E+00 nc 1.50E+00 7440-41-7 8.00E-04 c 7.45E-04 c 1.50E+02 nc 1.50E+02 7440-41-7 8.00E-01 nc 1.46E+02 nc 1.46E+02 nc 1.46E+02 7440-41-7 8.00E-04 nA 1.46E+02 nc 1.46E+02 nc 1.46E+02 7440-41-8 NA NA NA 1.46E+02	Nitrogen Oxide (NOx)	10024-97-2	1.00E+02		NA NA		1 DOE+02	A.30E-103			ш	2.30E+05
1240-38-9 NA	124-38-9 NA NA NA NA 7496-90-5 8.00E+01 NA 3.65E+00 NA 7429-90-5 NA 3.65E+00 nc 3.65E+00 7420-36-0 NA 4.16E+00 nc 4.47E-04 7440-38-3 5.21E-01 nc 4.47E-04 c 4.47E-04 7440-38-3 5.21E-01 nc 4.47E-04 c 4.47E-04 7440-38-3 5.21E-01 nc 7.45E-04 c 8.00E-04 7440-47-3 NA 1.20E+04 c 1.07E-03 7440-47-3 NA 1.20E+02 nc 1.53E-04 7440-47-3 NA 1.20E+02 nc 1.53E-04 7440-47-3 NA 1.46E+02 nc 1.53E-04 7440-47-3 NA 1.46E+02 nc 1.53E-04 7440-47-3 NA 1.46E+02 nc 1.53E-04 7430-92-1 1.50E+00 nA 1.53E-04 nc 1.53E-02 7440	HCI (CEM System)	7647-01-0	2.08E+01	ည	2.08E+01	00	2.00E+02	4 4	4.77E+US	¥.	-	2.70E+05
7446-09-5 8.00E+01 NA 3.05E+00 NA 3.05E+00 NA T 7440-09-6 NA 3.05E+00 nc 3.05E+00 nc 3.05E+00 NA 1.05E+02 NA T 7440-38-2 A.77E-04 c 4.47E-04 nc 4.47E-04 nA 1.05E+03 NA T 7440-38-2 4.47E-04 c 4.47E-04 nA 1.05E+03 NA T 7440-38-2 4.07E-01 nc 4.47E-04 c 4.47E-04 nA 1.05E+03 NA T 7440-47-3 1.07E-03 c 3.46E-04 c 4.05E-03 NA T T 7440-47-3 1.07E-03 nA 1.50E+03 NA T T A A A A A A A A A A A A A A A A A A A A A A A A A A	746-09-5 8.00E+01 NA 3.65E+00 nc 3.65E+00 r 7429-90-5 NA 1.46E+00 nc 3.65E+00 nc 3.65E+00 7440-39-0 NA 1.46E+00 nc 1.46E+00 nc 1.46E+00 7440-39-0 5.21E-01 nc 4.17E-04 c 4.47E-04 c 3.521E-01 7440-43-9 1.07E-03 c 9.94E-04 c 1.07E-03 c 3.04E-04 c 1.07E-03 7440-43-9 1.07E-03 c 9.94E-04 c 1.07E-02 d 1.07E-03 7440-43-9 NA nA 1.46E+02 nc 1.50E+02 nc 1.50E+02 7440-43-9 NA NA 1.46E+02 nc 1.50E+02 nc 1.50E+02 7439-95-4 NA NA 1.30E+01 nc 1.30E+01 nc 1.30E+01 7789-95-4 NA NA 1.33E+01 nc 1.30E+02 nc 1.46E+02	Carbon Dioxide (CO ₂)	124-38-9	Ϋ́		NA	2	ALOCETO I	4	4.4/E+03	A V	-	4.47E+03
748-90-6 NA 3.65E+00 nc 3.65E+00 nc 3.65E+00 nc 3.65E+00 nc 3.65E+00 nA 1.75E+02 NA T 7440-39-3 5.21E-01 nc 4.146E+00 nc 4.46E+00 NA 1.50E+03 NA T 7440-39-3 5.21E-01 nc 5.11E-01 nc 5.11E-04 nc 5.21E-01 NA T 7440-43-9 5.21E-01 nc 5.11E-04 nc 5.21E-04 NA 1.7 7440-43-9 1.07E-03 nA 1.05E+03 NA 1 T 7440-43-9 1.05E-04 n 1.05E-03 NA 1 T 7440-43-9 1.05E-00 nA 1.05E-03 NA 1 T 7440-43-9 1.05E+00 nA 1.06E+02 NA 1.06E+03 NA 1 7440-43-9 1.05E+00 NA 1.06E+02 NA 1.06E+02 NA 1.1 7430-35-4 <	7429-90-5 NA 3.65E+00 nC 3.65E+00 7440-36-0 NA 1.46E+00 nC 1.46E+00 7440-38-2 5.21E-01 nC 1.45E+04 c 4.47E+04 7440-38-3 5.21E-01 nC 7.45E-04 c 4.7E-04 7440-41-7 8.00E-04 c 7.45E-04 c 1.07E-03 7440-43-9 1.07E-03 c 9.94E-04 c 1.07E-03 7440-43-9 1.07E-03 c 1.53E-04 c 1.07E-03 7440-43-9 1.07E-03 c 1.53E-04 c 1.07E-03 7440-43-9 1.07E-03 nA 1.46E+02 nC 1.53E-04 7440-43-9 NA 1.46E+02 nC 1.53E-04 nA 1.53E-04 7439-95-4 NA NA NA NA 1.46E+02 NA 1.53E-04 7439-95-4 NA NA 1.83E+01 nC 7.30E+01 NA 7440-26-5 NA NA<	Sulfur Dloxide (SO ₂)	7446-09-5	8.00E+01		₹ Z		8 00F±01	7 POE +02		¥.	-	5.40E+07
7440-36-0 NA 1.46E+00 NC 1.46E+00 NC 1.46E+00 NA 3.00E+01 NA T 7440-38-2 5.21E-04 nc 4.47E-04 nc 4.47E-04 NA 3.00E+01 NA T 7440-38-3 5.21E-04 nc 4.47E-04 nc 4.47E-04 NA 1.00E+01 NA T 7440-43-9 1.07E-03 nc 1.07E-03 NA 1.00E+01 NA T 7440-43-9 1.07E-03 nA 1.00E+01 NA T T 7440-43-0 NA 1.46E+02 nc 1.07E-03 NA T 7440-43-0 NA 1.46E+02 nc 1.07E-03 NA T 7440-43-0 NA 1.46E+02 nc 1.07E+03 NA T 7440-43-0 NA 1.46E+02 nc 1.56E+02 NA 1.07E+03 7440-43-0 NA 1.56E+02 nc 1.56E+02 NA 1.7	7440-36-0 NA 1.46E-00 nc 1.46E-00 7440-36-2 4.47E-04 c 4.15E-04 c 4.47E-04 c 4.47E-03 c 5.46E-02 c 4.47E-03 c 5.26E-02 c 4.47E-03 c 5.46E-02 c 4.47E-03 c 5.46E-02 c 4.47E-03 c 6.440-43-9 c 6.47E-03 c 6.440-43-9 c 6.440-43-1 c 6.440-1 c 6.440-1 c 6.440-1 c 6.440-1 c 6.440-1 c 6.440-1 c 6.440	Aluminum	7429-90-5	ΨX		3.65E+00	00	3 655+00	1.03ETUZ		Ϋ́	ш	7.89E+02
7440-38-2 447E-04	7440-38-2 4.47E-04 C 4.15E-04 C 4.47E-04 7440-38-3 5.21E-01 nc 5.11E-01 nc 5.21E-01 7440-43-9 1.07E-03 c 7.45E-04 c 8.00E-04 7440-47-3 1.07E-03 c 1.53E-04 c 1.07E-03 7440-48-4 NA c 2.20E-02 c 1.53E-04 7440-48-4 NA c 2.20E+02 nc 1.46E+02 7430-95-4 1.50E+00 NA 1.46E+02 nc 1.46E+02 7430-95-5 1.1E-02 NA 1.30E+01 nc 1.46E+02 7430-95-5 1.1E-02 NA 1.30E+01 nc 1.46E+02 7440-02-0 NA 7.30E+01 nc 1.83E+01 nc 1.30E+01 740-22-0 NA NA 1.83E+01 nc 1.83E+01 nc 1.83E+01 7440-22-0 NA NA 1.00E+03 NA NA NA 7440-22-0 </td <td>Antlmony</td> <td>7440-36-0</td> <td>ΝΑ</td> <td></td> <td>1,46E+00</td> <td>2</td> <td>1.46F±00</td> <td>X V</td> <td>3.00E+04</td> <td>¥.</td> <td>- -</td> <td>3.00E+04</td>	Antlmony	7440-36-0	ΝΑ		1,46E+00	2	1.46F±00	X V	3.00E+04	¥.	- -	3.00E+04
7440-39-3 5.21E-01 nc 5.71E-01 nc 5.21E-01 nc 5.21E-01 nc 5.21E-01 nc 7.46E-03 nc 7.46E-03 nc 7.440-47-3 nc 7.440-47-3 nc 7.440-47-3 nc 7.440-47-3 nc 7.46E-03 nc 7.40E-03 nc 7.440-47-3 nc 7.46E-02 nc 7.20E-02	7440-39-3 5.21E-01 nc 5.11E-01 nc 5.21E-01 7440-47-3 NA c 7.45E-04 c 8.00E-04 7440-47-3 NA c 1.53E-04 c 1.07E-03 7440-47-3 NA c 1.53E-04 c 1.07E-03 7440-48-4 NA 1.46E+02 nc 1.63E-04 7440-48-4 NA 1.46E+02 nc 1.46E+02 7439-92-1 1.50E+00 NA 1.46E+02 nc 1.46E+02 7439-95-4 NA 1.43E+01 nc 7.30E+01 7440-28-0 NA 1.83E+01 nc 7.30E+01 7740-28-0 NA 1.83E+01 nc 1.83E+01 7740-28-0 NA 1.10E+03 nc 1.16E+03 7440-66-6 NA 1.10E+03 nc 1.16E+03 7440-66-6 NA 1.41E-01 nc 2.56E-01 7440-28-0 NA	Arsenic .	7440-38-2	4.47E-04	U	4.15E-04	0	A 47E-04	2 4	1.3001	¥.	-	1.50E+03
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7439-92-1 1,50E+00 NA 1,50E+02 NA T 7439-92-4 NA NA 1,50E+02 NA T 7439-92-4 NA NA NA 1,50E+03 NA T 7439-92-4 NA NA 7,30E+01 NA 1,50E+03 NA T 7440-02-0 NA 1,183E+01 nC 5,11E-02 NA 1,50E+03 NA T 7740-02-0 NA 1,83E+01 nC 1,83E+01 NA 3,00E+02 NA T 7740-22-4 NA 1,10E+03 nC 1,10E+03 NA 1,10E+03 <td< td=""><td>7439-92-1 1,50E+00 NA 1,50E+00 7439-95-4 NA NA 1,50E+00 7439-96-5 5.11E-02 nC 5.22E-02 nC 5.11E-02 740-02-0 NA NA NA NA NA 7723-14-0 NA 1.83E+01 nC 7.30E+01 NA 7740-22-4 NA 1.83E+01 nC 1.83E+01 NA 7440-66-6 NA 1.10E+03 nC 1.10E+03 NA 7440-66-6 NA 1.10E+03 nC 1.10E+03 NA 7440-66-6 NA NA NA NA NA 7440-66-6 NA 1.10E+03 nC 1.10E+03 NA 74-84-0 NA NA NA NA NA 74-86-1 NA NA NA NA 74-86-2 NA NA NA NA 106-97-8 NA NA NA 106-97-8 NA NA<td>Copper</td><td>7440-50-8</td><td>NA NA</td><td></td><td>1 46F+02</td><td>2 6</td><td>1 485.00</td><td>Y Y</td><td>6.00E+01</td><td>YZ.</td><td>_</td><td>6.00E+01</td></td></td<>	7439-92-1 1,50E+00 NA 1,50E+00 7439-95-4 NA NA 1,50E+00 7439-96-5 5.11E-02 nC 5.22E-02 nC 5.11E-02 740-02-0 NA NA NA NA NA 7723-14-0 NA 1.83E+01 nC 7.30E+01 NA 7740-22-4 NA 1.83E+01 nC 1.83E+01 NA 7440-66-6 NA 1.10E+03 nC 1.10E+03 NA 7440-66-6 NA 1.10E+03 nC 1.10E+03 NA 7440-66-6 NA NA NA NA NA 7440-66-6 NA 1.10E+03 nC 1.10E+03 NA 74-84-0 NA NA NA NA NA 74-86-1 NA NA NA NA 74-86-2 NA NA NA NA 106-97-8 NA NA NA 106-97-8 NA NA <td>Copper</td> <td>7440-50-8</td> <td>NA NA</td> <td></td> <td>1 46F+02</td> <td>2 6</td> <td>1 485.00</td> <td>Y Y</td> <td>6.00E+01</td> <td>YZ.</td> <td>_</td> <td>6.00E+01</td>	Copper	7440-50-8	NA NA		1 46F+02	2 6	1 485.00	Y Y	6.00E+01	YZ.	_	6.00E+01
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Appendix C: Health-Based Screening Levels and Acute Toxicity Values

		*Redion 9	anoxine.	Late le les	SYCHAST ESSENCE TO STATE OF ST	Parallife Brooks	Total Section 1	The second	Name and Address of the Owner, where		MANAGE STATES STATES
) වැල්ල්ල්ල්ල	(e/K)	9):10	(Herologian	بازد ال	- A charalist	States the little little with	्राजीस ।		, erel	Septem 1	
State of the state of		(, () ute(fre))	((c) (1) (c)	Wifering .	(Old (1975))	(Christian)	(Display)	in location in		(0)	(19)/of 16;
1,3-Butadiene	106-99-0	3.74E-03	O	3.48E-03	O	3.74E-03	2.20E+04	2.21E+04	Ϋ́	E	2.20E+0
n-Butane	106-97-8	Ϋ́		NA		NA	NA	5.71E+06	ΑN	F	5.71E+06
trans-2-Butene	624-64-6	AA		NA		NA	NA	ΑN	ΑN		
2,2-Dimethylpropane	463-82-1	AN		AN		AN	Ϋ́	ΑN	Ϋ́		
cis-2-Butene	590-18-1	NA		ΝA		NA	AN	Ϋ́Z	ΑN		
3-Methyl-1-butene	563-45-1	NA		AN		AN	ΑN	ΑN	Ϋ́		
i-Pentane	109-66-0	NA		ΝΑ		ΝΑ	ΑN	1.80E+06	Ϋ́	_	1.80E+06
1-Pentene	179-601	ΝΑ		ΝΑ		AN	ΑN	Ą	AA		
2-Methyl-1-butene	563-46-2	A A		ΑN		AN	Ϋ́	Ϋ́Z	¥		
n-Pentane	109-66-0	NA		ΝA		AN	ΑN	1.80E+06	¥Z	-	1.80E+06
Isoprene	2-62-82	ΑN		AN		NA	ΑN	Ϋ́	¥		
trans-2-Pentene	646-04-8	ΑN		AN		AN	ΑN	Ϋ́Z	¥		
cis-2-Pentene	627-20-3	ΝA		ΑN		NA	ΑN	Ϋ́	ΑN		
2-Methyl-2-butene	513-35-9	ΑN		ΥN		NA	AN	Ϋ́	Ν		
2,2-Dimethylbutane	75-83-2	AN		ΑN		ΝΑ	Ϋ́N	1.80E+06	Ϋ́	۲	1.80E+06
Cyclopentene	142-29-0	AN		NA		NA	ΑN	ΑN	ΑA		
4-Methyl-1-pentene	691-37-2	Ϋ́		AN		AN.	Ϋ́	ΑN	Ϋ́		
Cyclopentane	287-92-3	NA		ΥN		AN	AN	ΑN	A.A.		
2,3-Dimethylbutane	79-29-8	NA		ΑN		AN	ΑN	ΑN	AN NA		
cis-4-Methyl-2-pentene	691-38-3	NA		٩Z		AN	NA	ΑN	¥.		
2-Methylpentane	107-83-5	NA		ΑN		NA	Ϋ́	1.80E+06	¥	-	1.80E+06
3-Methylpentane	96-14-0	AN		ΑN		NA	ΑN	ΑN	¥		
2-Methyl-1-pentene	763-29-1	NA		AN		NA	Ϋ́	ΑN	¥.		
1-Hexene	592-41-6	AN		AN		AN	ΑN	1.03E+05	Y.	۲	1.03E+05
п-Нехапе	110-54-3	2.10E+02	၁ပ	2.08E+02	nc	2.10E+02	ΥN	5.28E+05	ΑA	-	5.28E+05
trans-2-Hexene	4050-45-7	ΑN		ĄN		NA	ΑN	ΑN	ΑĀ		
2-Methyl-2-pentene	625-27-4	Ϋ́		ΑN		NA	Ϋ́	ΑN	ΑA		
cis-2-Hexene	7688-21-3	Ϋ́		ΑN		NA	ΑN	ΑN	ΑĀ		
Methylcyclopentane	96-37-7	NA		AN		ΑΝ	ΑN	Ą	N.		
2,4-Dimethylpentane	108-08-7	AN		AN		NA	ΑN	ΑN	X A		
Benzene	71-43-2	2.50E-01	ပ	2.16E-01	O	2.50E-01	1.56E+05	1.60E+05	A.	ш	1.56E+05
Cyclohexane	110-82-7	NA		NA		NA	ΝΑ	3.10E+06	AN	-	3.10E+06
2-Methylhexane	591-76-4	AN		ΑN		NA	ΑN	¥	Y Y		
2,3-Dimethylpentane	565-59-3	AA		۸N		NA	ΑN	ΑN	¥		
3-Methylhexane	589-34-4	NA		ΑN		AN	ΑN	AN	¥		
2,2,4-Trimethylpentane	540-84-1	ΑN		AN		NA	AA	3.50E+05	A A	L	3.50E+05
n-Heptane	142-82-5	Ϋ́Z		AN		ΝΑ	Ϋ́	1.80E+06	ΑĀ	-	1.80E+06
2 A A Trimothy 4 southers	1 00 201										

		Company of the state of the sta							A Linear State of the later of	وجود والسروف يتعلق ودوا فوروع الم	Carlo
(columbitud)	#IS#3	SECOND SECOND	mostelis Elicionii	Repleme Rec	Trossibility Entitlessim		55.75	前	भावतः	Source.	Kellie (kodiely) Vellije
	400 07 2	2 10E 103	Moundoid)	200	TO DE DE	3 10E+03	級(hg/my)器	4 81E+06	NA	T	4.81E+06
Methylcyclonexane	7-10-001	3, 105, 103	2	3.14	2	NIA NIA	VIV	NIA	AM		
2,4,4-Trimethyl-2-pentene	107-40-4	¥ 5		X × X		V V	2 2	Y A	Y AN		
2,5-Ulmethyinexane	580.43.5	₹		Q N		AN	Ϋ́	¥	¥.		
2,4-Uimeinyinexane	565-59-3	Z Z		AN.		NA A	₹ Z	ΑΝ	ΑA		
Tolliana	108-88-3	4.02E+02	2	4.16E+02	ည	4.02E+02	1.88E+05	1.89E+05	NA	Е	1.88E+05
2.3-Dimethylhexane	584-94-1	A'A		ΑN		NA	NA	NA	NA		
2-Methylheptane	592-27-8	AN		ΝΑ		NA	۷A	NA	ΝA		
3-Ethylhexane	619-99-8	NA		ΝA		NA	A'N	AA	ΑN		
2.2-Dimethylheptane	1071-26-7	Ϋ́		NA		NA	ΑN	ΝA	NA		
2.2.4-Trimethylhexane	16747-26-5	Ϋ́		NA		NA	NA A	۸A	۸N		
n-Octane	111-65-9	NA A		ΝΑ		NA	NA	ΝA	A A		
Ethylovolohexane	1678-91-7	Ϋ́		Ϋ́		NA	NA	NA	NA		
Ethylbenzene	100-41-4	1.10E+03	nc	1.06E+03	ဥ	1.10E+03	NA	5.43E+05	NA	⊢	5.43E+05
m-Xvlene & n-Xvlene	108-38-3	Ϋ́		ΨN		AN	NA	6.51E+05	NA	⊢	6.51E+05
Styrene	100-42-5	1.10E+03	nc	1.04E+03	ဥ	1.10E+03	2.13E+05	2.13E+05	Ϋ́	Е	2.13E+05
euelyX-o	95-47-6	7.30E+02	nc	7.30E+03	nc	7.30E+02	NA	6.51E+05	ΑΝ	_	6.51E+05
n-Nonane	111-84-2	AN		4.02E+02	DC	4.02E+02	۷	1.05E+06	Ą	-	1.05E+06
i-Propylbenzene	98-82-8	4.00E+02	nc	4.02E+02	uc	4.00E+02	Y Y	7.37E+05		⊢	7.37E+05
n-Propylbenzene	103-65-1	3.65E+01	nc	1.46E+02	uc	3.65E+01	۷A	3.68E+05		<u>-</u>	3.68E+05
p-Ethyltoluene	622-96-8	AN		NA		NA	ΝΑ	1,25E+05		⊢	1.25E+05
m-Ethyltoluene	620-14-4	N.		ΑN		AN	AN	NA	Ϋ́		
1.3.5-Trimethylbenzene	108-67-8	6.20E+00	nc	6.21E+00	ည	6.20E+00	۸N	3.68E+05		⊢	3.68E+05
o-Ethyltoluene	611-14-3	ΝA		NA		NA	ΑN	7.50E+02		-	7.50E+02
1.2,4-Trimethylbenzene & sec-Butylbenzene	95-63-6	6.21E+00	ည	6.21E+00	nc	6.21E+00	Ϋ́	1.80E+05		-	1.80E+05
n-Decane	124-18-5	AN		ΑN		NA	ΝΑ	4.37E+03		-	4.37E+03
alpha-Pinene	80-26-8	NA		ΥN		AN	ĄZ	4.00E+04	¥	-	4.00E+04
beta-Pinene	127-91-3	NA		ΑΝ		NA	ΑN	ΔA	Y V		
delta 3-Carene	13466-78-9			ΑN		NA	Ϋ́Z	ďΖ			
d-Limonene	5989-27-5	AN		Ϋ́		NA	ΑN	3.50E+05		-	3.50E+05
MTBE	1634-04-4	3.10E+03	nc	3.13E+03	ဥ	3.10E+03	Ϋ́	4.32E+05			4.32E+05
Dichlorodifluoromethane	75-71-8	2,10E+02	uc	1.83E+02	nc	2.10E+02	∀ Z	1.48E+07		۲	1.48E+07
Methylchloride	74-87-33	1.07E+00	၁	1.79E+00	ပ	1.07E+00	ΨZ Z	¥	Ϋ́Z		
Dichlorotetrafluoroethane	374-07-2	NA		NA		NA	A N	ΑN	ΑN		
Chloroethene	75-01-4	2.20E-02	ပ	2.09E-02	ပ	2.20E-02		-		-	1.28E+04
1,3-Butadiene	106-99-0	3.74E-03	ပ	3.48E-03	O	3.74E-03	2.20E+04	_		ш	2.20E+04
Methylbromide	74-83-9	5.20E+00	၁ပ	5.11E+00	ည	5.20E+00	¥	5.82E+04		F	5.82E+04
Ethylchlorida	75,00.3	0 305+00	,	2 485.00	,	つっちにすりつ	< Z	100	× 2	-	0011001

2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 -		10.00 Miles 10.00	For the	For the Chronic Evaluation (HBSL)	luation (HB	(TS		Forth	For the Acute Evaluation (ATA)	A) dollarile	- V
		J&@ [6m 9	WINOXICILO	Replien	W WONTEN	H BARITH HAGA		Table Section 1		Under the second	
(Coupeduit	(3/6)	वह		ોકાર્ય	-400 m	डिक्टलनगामः । पद्भार	(11.00)	TETALS.	∕ंडले	Separae	
			(60 (0) 1(6)	((Selection)	Se 185	(tale) in	A region 1	(Selfor)	\$ 29/01/03	MAN STATE	11 (c) (E)
Trichioromonoliuoromethane	75-69-4	7.30E+02	ဥ	7.30E+02	nc	7.30E+02	Ϋ́Z	2,81E+06	ΑN	_	2 81E+08
VIII) VII VII VII VII VII VII VII VII VI	75-35-4	3.84E-02	ပ	3.58E-02	o	3.84E-02	Ϋ́	7.92E+04		-	7 92E±04
Methylene chloride	75-09-2	4.10E+00	O	3.79E+00	O	4.10E+00	6.96E+05	6,94E+05		ш	6 96F±05
Allyl chloride	107-05-1	1.04E+00	JC 2	NA		1.04E+00	9.39E+03			u	0 305-03
1,1,2-1 richloro-1,2,2-trifluoroethane	76-13-1	3.13E+04	nc	3.14E+04	ЪП	3.13E+04	Ϋ́	_	NA N	1 -	9.33E+03
1,1-Dichloroethane	75-34-3	5.21E+02	nc	5.11E+02	nc.	5.21E+02	ΨN	1 21F+06	ΔN	- -	4 24E+06
1,2-Dichloroethene	540-59-0	NA		3.29E+01	DC.	3.29E+01	ΑN	2.38F+06	5 305+04		5.21E+00
Chloroform	67-66-3	8.35E-02	၁	7.73E-02	ပ	8.35E-02	ĄV	9 76F+03	NA N	C -	0.766+04
1,2-Dichloroethane	107-06-2	7.39E-02	၁	6.88E-02	O	7.39E-02	AN AN	8 08E+03	ΔN	-	9.10E.103
Methylchloroform	71-55-6	1.04E+03	nc	2.30E+03	20	1.04E+03	1.94E+06	191F+06	AN	- u	4 045+03
Benzene	71-43-2	2.49E-01	့ပ	2.16E-01	o	2.49E-01	ΔN	1 605+05	VV	1 1	1.945.100
Carbontetrachloride	56-23-5	1.28E-01	nc	1.18E-01	52	1.28E-01	1 28E+05	1 26F+05	2 2	- 1	1.005+05
1,2-Dichloropropane	78-87-5	9.89E-02	O	9.21E-02	c	9 89F-02	AIA	20 E 10 E	2 2	1	1.405+03
Trichloroethylene	79-01-6	1.12E+00	U	1.04E+00	C	1 12E+00		5 375+05	2 2	- -	5.08E+05
cis 1,3-Dichloro-1-propene	10061-01-5	ΨN		A'N		AN		3.37 E + 03	2 2	-	5.37E+U5
trans 1,3-Dichloro-1-propene	10061-02-6	ΑN		ĄZ		ΔN	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	1.14E104	¥ <	-	1.14E+04
1,1,2-Trichloroethane	79-00-5	1.20E-01	c	1 12F-01	,	4 20E 04	C < 2	10.75	¥ :	,	
Toluene	108-88-3	4.02E+02	20	4 16E+02	, ;	4 00E+00	10. Lo	1.04 = +0.5	¥.	-	1.64E+05
1,2-Dibromoethane	106-93-4	8 73E-03	2	8 24E 03	2	4.045+04	1.88=+05	1.89E+05	ΑN	ш	1.88E+05
Perchloroethylene	127-18-4	3 34 5 400)	2 425.00	o	8.735-03	AN	1.54E+05	Ϋ́Α	_	1.54E+05
Chlorobenzene	100 00 7	6.2011.04	5	3.135+00	٥	3.31E+00	6.89E+05	6.78E+05	NA	ш	6.89E+05
Ethylbarzana	100-90-7	0.20E+01	20	6.21E+01	22	6.20E+01	NA	1.38E+05	۸N	F	1.38E+05
m.g.s. Viloso	100-41-4	7.00E+03	ည	1.06E+03	nc	1.06E+03	۸N	5.43E+05	ΑZ	-	5.43E+05
Shrons	108-38-3	7.30E+02	ည	¥.		7.30E+02	AN	6.51E+05	ΑN	-	6.51E+05
1 1 2 Totrachlandhaa	100-42-C	1.06E+03	ည	1.04E+03	nc C	1.06E+03	2.13E+05	2.13E+05	ΑN	ш	2.13F+05
C. Video	/9-34-5	3.31E-02	٥	3.13E-02	ပ	3.31E-02	ΑN	2.06E+04	ΑN	-	2.06E+04
D-Ayland	95-47-6	7.30E+02	ည	7.30E+03	nc	7.30E+02	A'N	6.51E+05	ΑN	-	6.51E+05
1.3 5. Trimethylberzene	400 67 0	NA P		ΨV		NA	ΝΑ	1.25E+05	ΑN	-	1,25E+05
1.2.4.Trimethylbenzene	8-70-01	6.21E+00	22	6.21E+00	ည	6.21E+00	NA	3.68E+05	Ϋ́Z	-	3.68E+05
Robinship	93-03-0	6.21E+00	ည	6.21E+00	nc	6.21E+00	ΝΑ	1.80E+05	- AA	-	1.80E+05
m-Dichlorohora	100-44-7	3.96E-02	ည	3.68E-02	ပ	3.96E-02	5.20E+03	5.17E+03	ΨN	ш	5.20E+03
ווייסוטוסוטים	541-73-1	3.29E+00	2	3.29E+00	20	3.29E+00	AN	3.61E+04	ΑN	-	3 61 5 + 04
p-Dichioropenzene	106-46-7	3.06E-01	ပ	2.85E-01	O	3.06E-01	Ϋ́	6.61F+05	ΔN	-	8.01E.01
o-Dichlorobenzene	95-50-1	2.09E+02	nc	3.29E+01	20	2.09E+02	Ą	3.01E+05	AN	-	3.015+05
1,2,4-1 richlorobenzene	120-82-1	2.08E+02	nc	2.08E+02	22	2.08E+02	Ą	3 71F+04	ΔN	- -	2.01E+03
Hexachlorobutadiene	87-68-3	8.73E-02	O	8.03E-02	O	8.73E-02	3.21E+04	3 20F+04	Q V	- -	2 24 11 104
Phenylacetylene	536-74-3	NA		AN		NA		NA	2 4 2	4	3.215+04
d-Limonene	5989-27-5	ΝA		ΑN		AN	V V	3 505105	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		1010
Methylnitrite	624-91-9	Ϋ́		AN		VIV	5 5	0.001	¥.	-	3.50E+05
		1		1 1/1 1		VAI	NA.	AA	۷		

			For the	or the Chronic Evaluation (HBSL)	luation (HB	ANS.	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	For the	Acute Eva	For the Acute Evaluation (ATV	(2)
the first the second of the se		KREGISTIGN	SIT OXICITOR!	REGIONAL	MALION IN WILLIAM	Ka Health based as	TATAL SERVICE	ALC: NO.	THE PERSON NAMED IN	4	#AcuterToxicity&
i pimoritos	iş İş	(1) (i) (i) (i) (ii) (ii) (ii) (ii) (ii)	majorina (General)	- (Alleria)	Manylo at	Streening/Level	(10 (m))	(Tight)		(1) (1) (1) (1) (1) (1)	Value
Acetonitrile	75-05-8	6.20E+01	2	6.21E+01	nc	6.20E+01	AN	1.01E+05	NA	T	1.01E+05
Acrylonitrile	107-13-1	2.80E-02	ပ	2.61E-02	O	2.80E-02	2.20E+04	2.17E+04	NA	ш	2.20E+04
Nitromethane	75-52-5	ΑN		ΝΑ		NA	NA	1.50E+05	NA	1	1.50E+05
Benzonitrile	100-47-0	ΑN		Ϋ́		NA	NA	1.50E+04	NA	Ţ	1.50E+04
Nitrobenzene	98-95-3	2.09E+00.	၁ပ	2.19E+00	JU.	2.09E+00	NA	1.51E+04	NA	_	1.51E+04
4-Methylbenzonitrile	104-85-8	AN		۷A		NA	NA	NA	NA		
Carbon Disulfide	75-15-0	7.30E+02	nc	7.30E+02	nc	7.30E+02	NA	3.73E+04	NA	⊢	3.73E+04
Thiophene	110-02-1	ΑN		ΝA		NA	NA	NA	NA		
Dimethyldisulfide	624-92-0	NA		ΑN		NA	4.00E+01	3.85E+01	NA	П	4.00E+01
2-Methylthiophene	554-14-3	ΑN		ΑN		NA	NA	NA	NA		
3-Methylthiophene	616-44-4	ΑN		Ϋ́		NA	NA	NA	NA		
Dimethyltrisuifide	3658-80-8	ΝA		Ϋ́		ΝΑ	NA	NA	NA		
1-Chlorobutane	109-69-3	1.46E+03	วน	1.46E+03	วน	1.46E+03	NA	NA	NA		
1-Bromo-2-chloroethane	107-04-0	ΑN		NA		۸N	NA	NA	NA		
2-Bromo-1-chloropropane	3017-95-6	NA		NA		ΑN	NA	NA	ΝA		
1,2-Dichlorobutane	541-33-3	ΝA		NA		ΑN	NA	NA			
1,2,3-Trichtoropropane	96-18-4	9.61E-04	ပ	3.13E-03	ပ	9.61E-04	Ϋ́	1.81E+05	Ϋ́	⊢	1.81E+05
1-Chloro-2-methylbenzene	95-49-8	7.30E+01	nc	7.30E+01	nc	7.30E+01	ΥZ	3.88E+05		⊢	3.88E+05
1-Chloro-3-methylbenzene	108-41-8	NA		NA		NA	ΑN	NA	NA		
1-Chloro-4-ethylbenzene	622-98-0	NA A		ΑĀ		A'A	AN	NA NA	Y V		
Pentachloro-1-propene	1600-37-9	NA		NA		NA	Ϋ́		ΑN		
Hexachloroethane	67-72-1	4.80E-01	O	4.47E-01	ပ	4.80E-01	A A	2.90E+04	AA	⊢	2.90E+04
1,2-Dichloro-3-methylbenzene	32768-54-0			NA		NA	ΑN	NA A	A A		
Carbonyl Sulfide	463-58-1	NA		NA		NA	۸A	9.84E+03	NA	⊢	9.84E+03
Trichloroacetonitrile	545-06-2	NA		NA		NA	ΑN	NA	NA		
Dichloroacetonitrile	3018-12-0	NA		Υ V		NA	A A	AA	ΑN		
Isothiocyanatomethane	556-61-6	NA		Ą		NA A	Ϋ́	Y V	٩		
1,1-Dichloro-2-propanone	513-88-2	NA		ΑN		VA	Ϋ́	ΑN	Ϋ́		
2-Thiophenecarboxaldehyde	98-03-3	ΑN		∀ Z		NA	¥	-	Ϋ́		
Acetaldehyde	75-07-0	8.73E-01	O	8.13E-01	Ö	8.73E-01	1.80E+04	-		ш	1.80E+04
Ethanol	64-17-5	Y Z		Š	·	NA		-		_	5.64E+06
Acrolein	107-02-8	2.09E-02	nc	2.08E-02	nc	2.09E-02	2.30E+02	-		ш	2.30E+02
Acetone	67-64-1	3.40E+02	၁င	3.65E+02	ည	3.40E+02	Ϋ́	2.37E+06		┸	2.37E+06
Propanal	123-38-6	Y V		Ϋ́		NA	Ϋ́	7.50E+04		T	7.50E+04
Furan	110-00-9	3.70E+00	2u	NA		3.70E+00	Ϋ́	1.67E+02		_	1.67E+02
2-Propanol	67-63-0	Ϋ́		Ϋ́		NA	¥	9.84E+05		_	9.84E+05
Methacrolein	78-85-3	NA		A A		NA	Ϋ́	AN	·		
MTBE	1634-04-4	3.10E+03	ဥ	3.13E+03	ည	3.10E+03	Y N	4.32E+05	Y V	_	4.32E+05

		A STATE OF THE STATE OF	For the	For the Chronic Evaluation (HBSL)	aluation (HB	(75)	Name and American	Forth	a Acute Ev	For the Acuite Evaluation (ATV	
		(September	11605/416/(67/	38.76 (6) A	16 18 18 18	THE HEADTH PARKETS	The second second	The same of the sa	The state of the s	TO THE PARTY OF	A Contraction of the second of the second
(S)	(6/18)	ाहरल	्रमार्शकार्म	-	्रात्त्र (ज्यात	ેમ્પ્યાના માત્રામાં કુમાં ક	14116	11111	//Jach	Seminary.	Walle
White the despoisable and the second second to the second	No. of the Contract of the Con	(1/6/(m 5)	(le or me)	Anjul (18)	1. 1. 1. Apr.	(estate a)	==	Taristics !!	Suloite	(ph.) = (a) = (a)	A STATE OF THE PARTY OF THE PAR
Methyl-vinyi ketone	78-94-4	NA		ΝA		NA	AN	8.61E+01	NA	7	8 64E±04
2,3-Butanedione	625-34-3	NA		AN		NA AA	AN	AN	4Z		0.0
Butanal	123-72-8	NA		NA		NA	¥	7.38E+04	Y.	į-	7.385+04
Z-Butanone	78-93-3	1.00E+03	nc	1.04E+03	ou	1.00E+03	Ϋ́	8.85E+05	ΑN	-	8 85E+05
2-Methylfuran	534-22-5	NA		NA		AN.	¥	Ą	N N		0.000
3-Methylfuran	930-27-8	NA		NA		ΑΝ	¥	A N	NAN N		
trans-2-Butenal	123-73-9	3.54E-03	C	3.30E-03	O	3.54E-03	¥	ΑN	AN N		
Tetrahydrofuran	109-99-9	9.89E-01	ပ	9.21E-01	ပ	9.89E-01		7.38E+05	Y.	_	7 385+05
3-Methyl-2-butanone	108-10-1	8.30E+01	nc	7.30E+01	DC	8.30E+01	ΑN	3.07E+05	Ž	-	3.07E+05
Acetic Acid	64-19-7	Ϋ́		NA		Ϋ́	Ϋ́	3.68E+04	Y.	-	3.68F+04
1-Butanol	71-36-3	3.65E+02	nc	3.65E+02	nc	3.65E+02	ΑN	1.52E+05	AN	-	1 52E±05
1-Penten-3-one	1629-58-9	AA		۸A		AN		Ϋ́Z	NA NA	-	20.175
Z-Pentanone	107-87-9	۸×		AN		AN.	AN	8 80F+05	ΨZ	1	RACETOR
Pentanal	110-62-3	۸N		٩N		Ā	Ą	NA NA	NA		0.001
2.3-Pentanedione	600-14-6	۸A		AN		ΑX	Ą	4V	AN		
1,2-Dichloro-2-methylpropane	594-37-6	NA		ΑN		AN	ĄZ	AN N	NA		
3-Pentanone	96-22-0	Y Y		ΑN		ΑN	4 Z	ĄV	AN		
2.5-Dimethylfuran	625-86-5	Ϋ́		NA		ΨX	Ą	A'N	AN		
4-Methyl-2-pentanone	108-10-1	8.30E+01	nc	7.30E+01	ည	8.30E+01	Ϋ́	3.07E+05	NA	}-	3 075 + 05
trans-3-Penten-2-one	3102-33-8	NA		ΑN		NA	ΨN	AN	V N	-	3.07 E+0.5
Cyclopentanone	120-92-3	ΑN		ΑN		AN N	Ą	AN	V V		
2-Hexanone	591-78-6	ΥN		5.11E+00	20	5.11E+00	AN	4 09F+04	47	۲	70007
Hexanal	66-25-1	NA		ΑN		AN AN	Ž	AN	ΔN	-	4.090.104
3-Furaldehyde	498-60-2	NA		ΑN		AN	AN	ΔN	ΔN		1
2-Cyclopenten-1-one	930-30-3	NA		ΑN		NA	¥	¥.	AN		
2-Furaldehyde	98-01-1	5.20E+01	nc	3.65E+01	DC.	5.20E+01	Ϋ́Z	7.86E+03	NA	-	7 RRE+03
1-Acetoxyacetone	592-20-1	Ϋ́		ΝA		AN	Ϋ́	¥	¥		20.100.
Z-Heptanone	110-43-0	ΑN		NA		NA	ΑN	7.01E+05	Ą	⊢	7.01F+05
Heptanal	66-25-1	ΑN		NA		ΝΑ	ΥN	Ϋ́	AN -		
5-iwetnyi-2-furaldenyde	620-02-0	Ϋ́Α		AN		ΝΑ	ΑN	ΑN	Ą		
Denzaldenyde	100-52-7	3.65E+02	SC.	3.65E+02	nc	3.65E+02	ΑN	1,50E+04	ΑN	-	1 50F+04
Benzoluran	271-89-6	Ϋ́		ΝA		NA	ΑN	₹ Z	Ą		1000
Octanal	124-13-0	A A		NA		AN	Ϋ́	₹ Z	NA		
Acetophenone	98-86-2	2.10E-02	ည	2.08E-02	uc	2.10E-02	ΝA	3.00E+04	¥	-	3 00F+04
Z-Nonanone	821-55-6	X X		AA		AN	A'N	ĄZ	AN		10000
Nonanal	124-19-6	Ϋ́		NA		NA	ΑN	Ą	Ä		
N-Nitrosodimethylamine	62-75-9	1.40E-04	ပ	1.23E-04	ပ	1.40E-04	AN	2.50E+03	ΑN	-	2.50F+03
Fyndine	110-86-1	3.65E+00	2	3.65E+00	ည	3.65E+00	ΝA	4 85E+04	ΔN	F	A OF E. O.
								1.000	-	-	4.00ET04

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्रह्मागुरुताम् ।	(1) (1) (1)	30 10 10 10 10 10 10 10 10 10 10 10 10 10		7 (15) (15) (15) (15) (15) (15) (15) (15)			5278		de la constant de la	SOU((9))	Vieticom Special Vietnam Vietn
2-Picoline	109-06-8	NA		NA		NA	NA	NA	NA		
Methyl methanesulfonate	66-27-3	AN		ΝA		AN	ΑĀ	ΑN	AN		
N-Nitrosomethylethylamine	10595-95-6	3.06E-04	υ	2.85E-04	o	3.06E-04	ΑĀ	Α×	ΑN		
N-Nitrosodiethylamine	55-18-5	4.47E-05	ပ	4.17E-05	ပ	4,47E-05	Ϋ́	NA	ΝA		
Ethyl methanesulfonate,	62-50-0	ΝΑ		NA		NA	ΝA	۷A	NA		
Phenol	108-95-2	2.19E+03	ည	2.19E+03	ou C	2.19E+03	3.85E+05	3.85E+04	NA	Е	3.85E+05
Aniline	62-53-3	ΝA		1.06E+00	nc	1.06E+00	NA	2.29E+04	3.00E+04	A	3.00E+04
bis(2-Chloroethyl)ether	111-44-4	5.80E-03	ပ	5.69E-03	ပ	5.80E-03	NA	5.85E+04	Ν	⊢	5.85E+04
Pentachloroethane	76-01-7	NA		NA		NA	NA	3.00E+04	NA	⊢	3.00E+04
2-Chlorophenot	8-22-96	1.83E+01	วน	1.83E+01	nc	1.83E+01	NA	5.25E+03	ΑN	⊢	5.25E+03
1,3-Dichlorobenzene	543-73-1	NA NA		ΑN		NA	NA	AN	NA		
1,4-Dichlorobenzene	106-46-7	2.80E-01	ပ	2.85E-01	ပ	2.80E-01	NA	6.61E+05	NA	1	6.61E+05
Benzyl alcohol	100-51-6	1.10E+03	ဥ	1.10E+03	ဥ	1.10E+03	NA	5.53E+04	NA	T	5.53E+04
2-Methylphenol	95-48-7	1.83E+02	ဥ	1.83E+02	ဥ	1.83E+02	NA	6.63E+04	Ϋ́	⊥	6.63E+04
1,2-Dichlorobenzene	95-50-1	2.09E+02	ဥ	3.29E+01	ဥ	2.09E+02	NA	3.01E+05	ΑN	_	3.01E+05
bis(2-Chlorolsopropyl)ether	108-60-1	1.92E-01	U	1.79E-01	ပ	1.92E-01	NA	6.99E+04	NA	_	6.99E+04
o-Toluidine	95-53-4	2.80E-02	ပ	2.61E-02	ပ	2.80E-02	NA	2.63E+04	AN	T	2.63E+04
4-Methylphenol/3-Methylphenol	1319-77-3	1.83E+01	ည	1.83E+01	2	1.83E+01	NA	6.63E+04	NA	Ţ	6.63E+04
N-Nitroso-di-n-propylamine	621-64-7	9.61E-04	ပ	8.94E-04	ပ	9.61E-04	NA	2.00E+02	NA	T	2.00E+02
Acetophenone	98-86-2	2.10E-02	ည	2.08E-02	ဥ	2.10E-02	۷A	3.00E+04	AN	T	3.00E+04
N-Nitrosomorpholine	59-89-2	ΑN		ΝΑ		AN	ΑN	3.00E+04	AN	T	3.00E+04
N-Nitrosopyrrolidine	930-55-2	3.15E-03	ပ	2.98E-03	ပ	3.15E-03	NA	NA	NA		
Hexachloroethane	67-72-1	4.80E-01	U	4.47E-01	ပ	4.80E-01	NA	2.90E+04	NA	T	2.90E+04
Nitrobenzene	98-92-3	2.09E+00	ວບ	2.19E+00	nc	2.09E+00	NA	1.51E+04	NA	⊢	1.51E+04
N-Nitrosopiperidine	100-75-4	Ϋ́		ΝΑ		NA	AN	NA	NA		
Isophorone	78-59-1	7.08E+00	ပ	6.59E+00	ပ	7.08E+00	AN	2.83E+04	NA	T	2.83E+04
2,4-Dimethylphenol	105-67-9	7.30E+01	JC.	7.30E+01	nc	7.30E+01	ΝA	NA	NA		
2-Nitrophenol	88-75-5	NA		NA		NA	AA	NA	NA		
bis(2-Chloroethoxy)methane	111-91-1	AN		NA		NA	A A	ΑN	NA		
Benzolc acid	02-82-0	1.50E+04	nc	1.46E+04	วน	1.50E+04	NA	1.25E+04	NA	⊢	1.25E+04
2,4-Dichlorophenol	120-83-2	1.10E+01	nc	1.10E+01	วน	1.10E+01	ΑN	3.00E+04	NA	T	3.00E+04
,2,4-Trichlorobenzene	120-82-1	2.08E+02	nc	2.08E+02	วน	2.08E+02	AA	3.71E+04	NA	Ţ	3.71E+04
Naphthalene	91-20-3	3.13E+00	nc	3.29E+00	uc	3.13E+00	ΝA	7.86E+04	NA	⊥	7.86E+04
p-Chloroaniline	106-47-8	1.46E+01	nc	1.46E+01	ည	1.46E+01	A A	3.00E+04	AN	_	3.00E+04
2,6-Dichlorophenol	87-65-0	NA		NA		NA	NA	3.00E+04	NA	T	3.00E+04
Hexachloropropene	1888-71-7	NA		NA		AN	Ϋ́	-	NA		
Hexachlorobutadlene	87-68-3	8.62E-02	ပ	8.03E-02	၁	8.62E-02	3.21E+04	3.20E+04	AN	В	3.21E+04
	000,										

(solutions)		*Rehlong	THE TANK I POST	THE PARTY CO.	The second second	The state of the last of the l			1		
	The second secon	BOND THE WATER				Call of Introduction	A COLUMN TO SERVICE	Section 2	The Right State of the State of	Chicago and Control of the Control o	Ž
	:	FFRS (mel(mt))	(fere) interest	STEYE	न्तर्गाक्ताम् १६ म् मास	Secondina Dava	311 6		लहरा	Sections:	
N-Nitroso-di-n-butylamine	924-16-3	1.20E-03	C	1.12E-03	0	1 20E-03	MINE ALLWAY	ACCEPTANCE OF THE PARTY OF THE	A V V	11(45) - 10(10)	Market (BUVIA) 12 AND
4-Chloro-3-methylphenol	35421-08-0	ΑN		ΦN	Ì	NIA OU	2 4	2	¥ .		
Safrole	94-59-7	Ϋ́		Q N		Q Z	4 4	X X	Y S		
2-Methylnaphthalene	91-57-6	ΑN		Ą.Z		NA	Q V	2 005+04	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	-	1000
1,2,4,5-Tetrachlorobenzene	95-94-3	1.10E+00	nc C	1.10E+00	ou.	1 10F+00	V V	2 00 = 104	2 2	-	Z.00E+04
Hexachlorocyclopentadiene	77-47-4	7.30E-02	20	7.30E-02	000	7 30E-02	2 2	3.00E+04	2 2	- -	3.00E+04
2,4,6-Trichlorophenol	88-06-2	6.20E-01	2	6.26E-01	2	8 20E-02	<u> </u>	2005-02	YZ.	-	2.23E+02
2,4,5-Trichlorophenol	95-95-4	3.65E+02	2	3.65E+02	2 8	0.20E-01	¥ <	3.00E+04	Y.	-	3.00E+04
Isosafrole	120-58-1	NA	2	NA	2	3.035+02	¥ 5	3.00=+04	¥.		3,00E+04
2-Chloronaphthalene	91-58-7	2.92E+02	22	2.92E+02	2	2 92F+02	¥ 2	S OCE TOO	¥ 2	,	1000
2-Nitroaniline	88-74-4	2.09E-01	nc	2.08E-01	2	2 09E-01	AN	0.005	<u> </u>		0.00=+02
1,4-Naphthoquinone	130-15-4	AN		NA NA		NA	Q A	2 50E+02	₹	ŀ	00.102.0
Dimethylphthalate	131-11-3	3.65E+04	20	3.65E+04	2	3.65E+04	AM	1 50E+04		- -	4 505-04
1,3-Dinitrobenzene	99-62-0	3.65E-01	υC	3.65E-01	20	3.65E-01	AN	3 OOF +03	V V	-	3 005+04
2,6-Dinitrotoluene	606-20-2	3.65E+00	nc	3.65E+00	2	3.65E+00	AN	6.00E+02	ΔN	1	8.00E+03
Acenaphthylene	208-96-8	NA		Ϋ́		AN	AN	2 00F+02	AN	- -	2.00E+02
3-Nitroaniline	99-09-2	NA		ΑN		AN	AN	NA NA	AN	-	4.00L 102
4-Nitrophenol	100-02-7	2.90E+01	.nc	2.92E+01	JL DL	2.90E+01	AN AN	3.00E+04	AN	1	3 00E+04
2,4-Dinitrophenol	51-28-5	7.30E+00	nc	7.30E+00	DU	7.30E+00	¥	7.50E+03	AN	- -	7.50E+03
Acenaphthene	83-32-9	2.19E+02	nc	2.19E+02	nc	2.19E+02	Ϋ́	1.25E+03	AN	-	1 25E±03
2,4-Dinitrotoluene	121-14-2	7.30E+00	nc	7.30E+00	. uc	7.30E+00	A'A	6.00E+02	Y.	-	6.00E+02
Dibenzoruran	132-64-9	1.46E+01	ည	1.46E+01	nc	1.46E+01	¥.	1.50E+00	AN	-	1 50E+00
Pentachiorobenzene	608-93-5	2.92E+00	၁ပ	2.92E+00	nc	2.92E+00	Ϋ́	3.00E+04	ΑĀ	-	3.00E+04
-Naphrnylamine	134-32-7	Y Z		Z A		AA	¥	3.50E+04	¥	F	3.50F+04
2.16 Tatachin	91-59-8	Ϋ́		Ϋ́		NA	ΑĀ	7.50E+03	A A	-	7.50E+03
Cistada de la Composición de l	2-06-99	1.10E+02	ဥ	1.10E+02	JC	1.10E+02	ΑN	ΑN	Y.		
4-Chlosophogiaphogiaphogia	7005 700	Z.92E+03	ဥ	2.92E+03	ည	2.92E+03	NA	1.50E+04	¥	-	1.50E+04
Elional	5-71-0001	AN C		Ψ.		NA NA	NA	ΑN	ΑĀ		
S-Nitro-o-ortin-8	00-13-1	1.40E+UZ	ည	1.46E+02	2	1.46E+02	NA	7.50E+04	- NA	⊢	7.50E+04
4-Nitropolipe	400 04 6	Z.00E-01	٥	1.90E-01	O	2.00E-01	NA	NA	NA		
4 6-Dinitro-2-methylphocol	534 53 4	Y Y		NA P		NA NA	NA	9.00E+03	N.	T	9.00E+03
Diphendlamine/N-Miscalon	60 75 0	A DATE OF		3.65E-01	2	3.65E-01	ΝA	5.00E+02	NA	L	5.00E+02
svm-Trinitrohorzene	00 25 4	407:00	o	1.23E-04	O	1.37E-04	Ϋ́	2.50E+03	NA	T	2.50E+03
Diallate	99-33-4	1.10E+02	2	1.10=+02	2	1.10E+02	NA	3.00E+04	NA	T	3.00E+04
Discontin	2303-10-4	1.10E-01	O	NA NA		1.10E-01	٧V	ΝA	AN		
/ Promonhouse Level at	62-44-2	ď.		ΑN		NA	ΑĀ	3.00E+04	Ϋ́	,_	3.00E+04
4-bioinophenylener	101-55-3	AN		V V		NA	AN	Ϋ́	AN		
Hexachiorobenzene	118-74-1	4.18E-03	c	3 01E 03		4 407 00					

			For the	or the Chronic Evaluation (HBSL)	luation (HB	SL)	\$100 A	For the	For the Acute Evaluation (ATV)	Iluation (A	TV)
Pilipopilios)	(8)/9	eRegiones			A MICOLOGIE	Seroenih basaden	SHE	TERL	VEG S	Source	PACUINTOXICITY LES TABLES
		# (poloni)	(Colling)	(feletter)).	(esolute)	$\psi_{i}(x,y)$	(60,00)	(depths)	((Louter)):	(extended to	A Cholin Med
4-Aminobiphenyl	92-67-1	NA		NA		NA	NA	1.50E+03	NA	T	1.50E+03
Pronamide	23950-58-5	2.74E+02	nc	NA		2.74E+02	NA	NA	NA		
Pentachlorophenol	87-86-5	5.60E-02	ပ	5.22E-02	C	5.60E-02	NA	1.50E+03	NA	H	1.50E+03
Pentachloronitrobenzene	82-68-8	2.59E-02	ပ	2.41E-02	O	2.59E-02	NA	1.50E+03	NA	1	1.50E+03
Phenanthrene	85-01-8	ΝΑ		NA		AN	NA	2.00E+03	NA	۲	2.00E+03
Anthracene	120-12-7	1.10E+03	nc	1.10E+03	nc	1.10E+03	NA	6.00E+03	ΑN	-	6.00E+03
Carbazole	86-74-8	3.36E-01	ပ	3.13E-01	C	3.36E-01	NA	ΥN	ΝA		
Di-n-butyiphthalate	84-74-2	3.65E+02	nc	3.65E+02	nc	3.65E+02	NA	1.50E+04	NA	_	1.50E+04
4-Nitroquinoline-1-oxide	56-57-5	ΑN		ΑN		NA	NA	۷A	NA		
Methapyrilene	91-80-5	NA		AN		NA	NA	ΑN	NA		
Fluoranthene	206-44-0	1.46E+02	nc	1.46E+02	nc	1.46E+02	NA	3.00E+01	NA	-	3.00E+01
Benzidine	92-87-5	2.90E-05	C	2.90E+00	၁	2.90E-05	NA	5.00E+02	NA	Ţ	5.00E+02
Pyrene	129-00-0	1.10E+02	nc	1.10E+02	nc	1.10E+02	۸A	1.50E+04	NA	Ţ	1.50E+04
p-Dimethylaminoazobenzene	60-11-7	ΑN		. AN		۸N	Ν	7.50E+04	NA	⊥	7.50E+04
Chlorobenzilate	510-15-6	2.49E-02	၁	2.32E-02	ပ	2.49E-02	ΝA	2.50E+02	NA	-	2.50E+02
Kepone	143-50-0	3.74E-04	ပ	ΑN		3,74E-04	ΝA	1.00E+02	NA	-	1.00E+02
Butylbenzylphthalate	85-68-7	7.30E+02	nc	7.30E+02	nc	7.30E+02	NA	5.00E+05	NA	Τ	5.00E+05
3,3'-Dimethylbenzidine	119-93-7	7.30E-04	C	6.81E-04	၁	7.30E-04	۸A	3.00E+00	NA	Ţ	3.00E+00
2-Acetylaminofluorene	53-96-3	NA		AN		NA	NA	2.50E+03	NA	T	2.50E+03
bis(2-Ethylhexyl)phthalate	117-81-7	4.80E-01	၁	4.47E-01	၁	4.80E-01	ΑN	1.00E+04	NA	⊢	1.00E+04
3,3'-Dichlorobenzidine	91-94-1	1.50E-02	ပ	1.39E-02	ပ	1.50E-02	ΝA	6.21E+03	NA	_	6.21E+03
Benz(a)anthracene	56-55-3	2.17E-02	ပ	8.58E-03	O	2.17E-02	Ν	6.00E+02	NA	⊢	6.00E+02
Chrysene	218-01-9	2.17E+00	င	8.58E-01	၁	2.17E+00	NA	2.00E+02	NA	Ţ	2.00E+02
Di-n-octylphthalate	117-84-0	7.30E+01	nc	7.30E+01	nc	7.30E+01	NA	1.50E+05	NA	Τ	1.50E+05
7,12-Dimethylbenz(a)anthracene	9-26-29	NA		NA		AN	Ϋ́	ΥN	NA		
Benzo(b)fluoranthene	205-99-2	2.17E-02	ပ	8.58E-03	ပ	2.17E-02	Ϋ́	Ϋ́	ΝA		
Benzo(k)fluoranthene	207-08-9	2.17E-01	ပ	8.58E-02	ပ	2.17E-01	ΑN	Ϋ́	NA NA		
Benz(a)pyrene	50-32-8	2.17E-03	υ	2.02E-03	O	2.17E-03	Ϋ́	7.50E+03	ΑN	-	7.50E+03
3-Methylcholanthrene	56-49-5	NA		ΝA		NA	ΑN	1.50E+03	ΑN	Н	1.50E+03
indeno(1,2,3-cd)pyrene	193-39-5	2.17E-02	ວ	8.58E-03	ပ	2.17E-02	NA	NA	NA		
Dibenz(a,h)anthracene	53-70-3	2.17E-03	o	8.58E-04	၁	2.17E-03	ΑN	3.00E+04	NA	_	3.00E+04
Benzo(g,h,l)perylene	191-24-2	AN		AN		NA	NA	3.00E+04	NA	1	3.00E+04
2-(2-quinoliny!)-(H)-indene-1,3-(2H)-dione		NA		ΑN		NA	ΑN	NA	NA		
Benzanthrone	82-05-3	NA		AN		NA	۸A	AN	NA		
Tetrachloroethene	127-18-4	3.31E+00	၁	3.13E+00	S	3.31E+00	NA	6.78E+05	NA	1	6.78E+05
(1,2-dichloroethyl)-benzene	1074-11-9			AN		ΝA	NA	ΝΑ	ΝA		
4-phenoxy-2(1H)-quinolinone	66662-28-0			AN.		NA	Y Y	NA	NA		
3-(phenylhydrazone)-1H-Indole-2,3-dione		NA		A'N		NA	¥	¥.	Ψ Z		

Appendix C: Health-Based Screening Levels and Acute Toxicity Values

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PRG: Preliminary Remediation Goals

c: Cancer

nc:non-cancer RBC: Risk-Based Concentration HBSL: Health-based Screening Level

(E) ERPG: Emergency Response Planning Guidelines (T) TEEL: Temporary Emergency Exposure Limits ATV: Acute Toxicliy Value NA: Not avallable

APPENDIX D RISK EVALUATION DATA

				od Smok	Red Smoke Grenade			
C _{chronic} (µg/m³)	<u></u>	Health-Based Screening Level (µg/m³)	C _{chronlc} / HBSL	> 1?	C _{acute} (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 12
5.72E-01		5.00E+01	1.14E-02	ou	1.00E+03	N		па
1.04E-05		2.08E+01	4.99E-07	no	7.28E-02	4.47E+03	1.63E-05	no
6.06E-07		2,09E-01	2.91E-06	no	1.06E-03	2.90E+03	3.66E-07	OU
3.78E-11		4.48E-08	8.42E-04	no	6.17E-07	3.50E+00	1.76E-07	no
2.19E-02		1.57E+02	1.39E-04	no	3.84E+01	2.30E+05	1.67E-04	no
1.60E-03		1.00E+02	1.60E-05	no	1.12E+01	2.70E+05	4.15E-05	no
2.57E-04		2.08E+01	1.23E-05	ou	1.80E+00	4.47E+03	4.04E-04	ou
2.92E-01		>N		na	2.04E+03	5.40E+07	3.79E-05	no
1.65E-03		8.00E+01	2.06E-05	ou	2.89E+00	7.89E+02	3.65E-03	no
1.96E-04		3.65E+00	5.38E-05	uo	1.38E+00	3.00E+04	4.59E-05	no
2.83E-06		1.46E+00	1.94E-06	no	1.98E-02	1.50E+03	1.32E-05	no
AN.		4.47E-04		na	NA	3.00E+01		na
1.95E-06		5.21E-01	3.75E-06	ou	1.37E-02	1.50E+03	9.13E-06	no
2.63E-13		8.00E-04	3.29E-10	ou	4.30E-03	5.00E+00	8.60E-04	no
NA		1.07E-03		na	NA	3.00E+01		na
6.76E-07		1.53E-04	4.43E-03	o C	1.11E-02	1.50E+03	7.37E-06	no
5.15E-07		2.20E+02	2.34E-09	ou .	3.61E-03	6.00E+01	6.01E-05	ou
NA		1.46E+02		na	NA	3.00E+03		na
7.60E-05		1.50E+00	5.07E-05	on O	5.33E-01	1.50E+02	3.55E-03	OU
4.49E-05		NV		na	3.15E-01	3.00E+04	1.05E-05	no
1.61E-06		5.11E-02	3.14E-05	ou	1.13E-02	3.00E+03	3.75E-06	ou
1.69E-06		7.30E+01	2.31E-08	ou	1.18E-02	3.00E+03	3.94E-06	no
NA		N		na	NA	3.00E+02		na
AN		1.83E+01		na	NA	6.00E+02		na
AN		1.83E+01		na	NA	3.00E+02		na
NA		2.56E-01		na	NA	3.00E+02		na
3.60E-05		1.10E+03	3.28E-08	no	2.52E-01	3.00E+04	8.40E-06	OU
7.57E-13		3:13E-01	2.42E-12	ou	5.30E-03	1.00E+02	5.30E-05	ou

Footnote:

(a) HCI/Cl₂ levels were too low to be reliably measured.

(b) Presence questionable - reported at similar levels in samples and blanks.

NA = Not applicable because compound was not detected.

na = Not available because health-based screening value is not available or not applicable if compound was not detected.

NV = No value

Controlle = Chronic time-averaged concentration; HBSL = Chronic health-based screening level Cacute = Acute concentration; ATV = Acute toxicity value

Red risk.xls

Table D-2: Comparison of Air Concentrations With Health-Based Values: Volatile Organic Compounds

			Rec	Smok	Red Smoke Grenade			
Compound (a)	С _{сһгопіс} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronic} / HBSL	> 17	C _{acute} (µg/m³)	Acute Toxicity Value (µg/m³)	Gacute/ ATV	> 12
Total Nonmethane Hydrocarbons (TNMHC)	MHC)							
TNMHC	1.92E-03	2		200	3 365+00	ANA.		
Volatile Organic Compounds (VOCs)					0.000	2		na
Ethane	5.45E-06	N/		0	0 557 00	7 11 4		
Ethylene	2.21E-04	2		2 2	9.33E-U3	NV NO. TOO	1000	na
Acetylene	3.35E-04	≥N		a e	5.87F-01	4.60E+US	3.30=-00	2
Propane	1.41E-06	N.		2	9 89E-03	3 785+06	200 700 0	E E
Propene	5.68E-05	>N		na	9.95E-02	NV NV	2.04E-US	2 2
i-Butane	1.37E-07	N		na	9.60E-04	5 71F+06	1 68E-10	200
i-Butene	7.61E-06	N/		na	1.33E-02	NN NN	2001	2 2
1-Butene	1.18E-05	N		na	2.06E-02	≥ N		200
1,3-Butadiene	1.24E-07	3.74E-03	3.32E-05	2	5.07E-04	2 20F+04	2 34E.08	<u>a</u>
n-Butane	5.40E-07	N/		na	3.79E-03	5.71F+06	6 63E-40	2 2
trans-2-Butene	1.07E-05	NV		na	1.88E-02	N	0.000	2 2
Z,Z-Dimethylpropane	NA	N		na	AN	N/		200
cis-2-Butene	2.49E-06	N		na	4.37E-03	>N		<u> </u>
3-Metnyl-1-butene	1.92E-06	N/		na	3.36E-03	N		2 2
I-Pentane	ΨN	N		na	AN	1.80E+06		0 0
2 Mothal 4 history	5.70E-06	N/		na	9.99E-03	N		2 0
n-Pentana n-Pentana	3.205-06	<u>N</u>		na	5.71E-03	>2		na
Sonene	42	NA.		na	Ŋ	1.80E+06		na
trans-2-Pentene	3.26E-08	N/A		na	ΑN	N N		na
cis-2-Pentene	NA NA	N. V		na	5./1E-03	N		na
2-Methyl-2-butene		NA NA		na	¥.	N<		na
2,2-Dimethylbutane	Q AN	AN AN		na	¥.	>N		na
Cyclopentene	V N	NA NA		na	AN	1,80E+06		na
4-Methyl-1-pentene		N.		na	ΝΑ	N		na
Cyclopentane	C - 2	2		na	A'A	N N		na
2.3-Dimethylbutana	(\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	2		na	ΝΑ	N		na
cis-4-Methyl-2-pentene	QZ V			na	AN.	N		na
		۸۸۱		na	NA	N		na

Table D-2: Comparison of Air Concentrations With Health-Based Values: Volatile Organic Compounds

			Red	Smoke	💛 🔆 🔆 Red Smoke Grenade			
Compound (a)	C _{chronic} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronlc} / HBSL	> 1?	С _{асиtе} (µg/m³)	Acute Toxicity Value (μg/m³)	C _{acute} / ATV	> 12
2-Methylpentane	NA	۸N		na	NA	1.80E+06		na
3-Methylpentahie	NA	۸N		na	NA	ΛN		na
2-Methyl-1-pentene	NA	N		na	NA	ΛN		na
1-Hexene	7.06E-06	NV		na	4.95E-02	1.03E+05	4.80E-07	ou
п-Нехапе	NA	2.10E+02		na	NA	5.28E+05		na
trans-2-Hexene	NA	NV		na	NA	>N		na
2-Methyl-2-pentene	NA	NV		na	NA	NΛ		na
cls-2-Hexene	NA	NV		na	NA	ΛN		na
Methylcyclopentane	NA	NV		na	۷N	N/		na
2,4-Dimethylpentane	NA	NV		na	AN	N N		na
Benzene	2,65E-05	2.50E-01	1.06E-04	no	1.09E-01	1.56E+05	6.96E-07	2
Cyclohexane	NA	NV		na	۷V	3.10E+06		na
2-Methylhexane	NA	N/		na	AN	NV		na
2,3-Dimethylpentane	NA	2		na	NA	N		na
3-Methylhexane	NA	⋛		na	AN	N/		na
2,2,4-Trimethylpentane	NA	2		na	NA	3.50E+05		na
n-Heptane	NA	≥N		na	NA	1.80E+06		na
2,4,4-Trimethyi-1-pentene	NA	2		na	ΝΑ	2		na
Methylcyclohexane	NA	3.10E+03		na	Ϋ́	4.81E+06		na
2,4,4-Trimethyl-2-pentena	NA	N		na	ΝΑ	N		na
2,5-Dimethylhexane	NA	2		na	ΑΝ	N<		na
2,4-Dimethylhexane	NA	· N		na	ΝΑ	N		na
2,3,4-Trimethylpentane	NA	N		na	NA	NV		na
Toluene	6.50E-06	4.02E+02	1.62E-08	on O	1.14E-02	1.88E+05	6.07E-08	ου
2,3-Dimethylhexane	NA	2		na	NA	NV		na
2-Methylheptane	AN AN	N		na	NA	NV		na
3-Ethylhexane	NA	N		na	NA	NV		na
2,2-Dimethylheptane ••	NA	N		na	NA	NV		na
2,2,4-Trimethylhexane	AN	2	-	na	NA	2		na
n-Octane	Ą	N		na	NA	N N		na
Ethylcyclohexane	AN	≥N		na	NA	N N		na
Ethylbenzene	2.36E-06	1.10E+03	2.14E-09	2	1.65E-02	5.43E+05	3.04E-08	οu

Table D-2: Comparison of Air Concentrations With Health-Based Values: Volatile Organic Compounds

			Rec	Smok	Red Smoke Granada			
Compound (a)	C _{chronic} (µg/m³)	§ §	C _{chronic} / HBSL	> 12	C _{acute} (µg/m³)	Acute Toxicity Value (µg/m³)	C _{acute} / ATV	>12
m-Xylene & p-Xylene	1,50E-05	>N		na	1.05E-01	6.51E+05	1.61E-07	5
Styrene	AN	1.10E+03		na	AN	2.13E+05		2 2
o-Xylene	1.38E-06	7.30E+02	1.88E-09	ou	9.64E-03	6.51E+05	1.48E-08	2
n-Nonane	AN	4.02E+02		na	AN	1.05E+06		2 2
i-Propylbenzene	NA	4.00E+02		na	AN	7.37E+05		a
n-Propylbenzene	NA	3.65E+01		na	AN	3.68E+05		0.00
p-Ethyltoluene	NA	N		na	NA	1.25E+05		2 2
m-Ethyltoluene	NA	N		na	AN	2		ed
1,3,5-Trimethylbenzene	ΝΑ	6.20E+00		na	NA	3.68E+05		BU
o-Ethyltoluene	NA	N		na	AN	7.50E+02		80
1,2,4-Trimethylbenzene & sec- Butylbenzene	NA	6.21E+00		na	AN	1 80F+05		na
n-Decane	3.97E-06	N		na	2.79E-02	4.37E+03	6.38E-06	20
alpha-Pinene	NA	N		na	AN	4.00E+04		60
beta-Pinene	NA	N		na	NA	N		na Eu
delta 3-Carene	AN	N		na	AN	N		80
d-Limonene	NA	NV		na	AN	3.50E+05		2 2
MTBE	AN	3.10E+03		na	AN	4.32E+05		na n
Dichiorodifluoromethane	6.01E-07	2.10E+02	2.86E-09	no	4.21E-03	1.48E+07	2.84E-10	02
Methylchloride	NA	1.07E+00		na	NA	N		na
Chlorottanioroetnane	NA	N		na	NA	N		na
1 3 Bufadions	3.33E-U6	2.20E-02	1.51E-04	no	5.44E-02	1.28E+04	4.27E-06	on O
Mathylpromide	1.20E-U/	3.74E-03	3.38E-05	20	5.16E-04	2.20E+04	2.35E-08	ou
Fibylchlodde	NA NET OT	5.20E+00		na	AA	5.82E+04		na
Trichloromonoflioromethana	7.45E-U/	2.30E+00	1.06E-07	2	4.01E-03	7.92E+06	5.06E-10	ou
Vivvldopopulation	NA POTOTO	7.30E+02		na	A'A	2.81E+06		na
Mathylanachlorida	0.30E-07	5.26E+08	1.24E-15	2	1.06E-02	7.92E+04	1.34E-07	ou
Allychlorida	3.88E-06	4.10E+00	9.47E-07	2	1.59E-02	6.96E+05	2.28E-08	ou
1.1.2-Trichloro-1.2.2-trifluoroethane	¥ × ×	1.04E+00		na	AN A	9.39E+03		na
1.1-Dichloroathana	\$ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	5.13E+04		na	ΨN	9.58E+06		na
1 2-Dichloroethene	1 00 1	3.215+02		na	NA	1.21E+06		na
	1.00=-00	3.29E+01	5.58E-08	2	3.21E-03	5.30E+04	6.06E-08	2

Table D-2: Comparison of Air Concentrations With Health-Based Values: Volatile Organic Compounds

				JIIONG	Ked Smoke Grenade			
Compound (a)	С _{сhronic} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronic} / HBSL	> 1?	С _{асиte} (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 1?
Chloroform	2.16E-05	8.35E-02	2.59E-04	no .	3.53E-01	9.76E+03	3.62E-05	ou
1,2-Dichloroethane	NA	7.39E-02		na	۷V	8.08E+03		na
Methylchloroform	NA	1.04E+03		na	VΝ	1.94E+06		na
Benzene	2.70E-05	2.49E-01	1.08E-04	no	4.41E-01	1.60E+05	2.77E-06	ou
Carbontetrachloride	2.00E-06	1.28E-01	1.56E-05	5	3.51E-03	1.28E+05	2.74E-08	2
1,2-Dichloropropane	NA	9.89E-02		na	NA	5.08E+05		na
Trichloroethylene	7.15E-07	1.12E+00	6.38E-07	no	1.17E-02	20+37E+05	2.18E-08	o D
cis 1,3-Dichloro-1-propene	NA	NV		na	ΝA	1.14E+04		na
trans 1,3-Dichloro-1-propene	NA	NV		na	NA	ΛN		na
1,1,2-Trichloroethane	NA	1.20E-01		na	NA	1.64E+05		na
Toluene	6.61E-06	4.02E+02	1.65E-08	no	1.16E-02	1.88E+05	6.18E-08	2
1,2-Dibromoethane	NA	8.73E-03		na	NA	1.54E+05		na
Perchloroethylene	1.03E-06	3.31E+00	3.11E-07	no	4.22E-03	6.89E+05	6.12E-09	ou
Chlorobenzene	4.79E-06	6.20E+01	7.73E-08	ou	3.36E-02	1.38E+05	2.43E-07	ou
Ethylbenzene	3.62E-06	1.06E+03	3.42E-09	ou	2.53E-02	5.43E+05	4.67E-08	OU
m&p-Xylene	1.52E-05	7.30E+02	2.09E-08	ou	1.07E-01	6.51E+05	1.64E-07	ou
Styrene	NA	1.06E+03		na	NA	2.13E+05		na
1,1,2,2-Tetrachloroethane	NA	3.31E-02		na	NA	2.06E+04		na
o-Xylene	1.40E-06	7.30E+02	1.92E-09	no	9.81E-03	6.51E+05	1.51E-08	ou
p-Ethyltoluene	NA	N		na	NA	1.25E+05		na
1,3,5-Trimethylbenzene	AA	6.21E+00		na	NA	3.68E+05		па
1,2,4-Trimethylbenzene	NA	6.21E+00		na	NA	1.80E+05		na
Benzylchloride	NA	3.96E-02		na	NA	5.20E+03		na
m-Dichlorobenzene	4.27E-07	3.29E+00	1.30E-07	no	2.99E-03	3.61E+04	8.29E-08	ou
p-Dichlorobenzene	1.32E-07	3.06E-01	4.32E-07	no	2.16E-03	6.61E+05	3.27E-09	ou
o-Dichlorobenzene	4.39E-06	2.09E+02	2.10E-08	ou	3.07E-02	3.01E+05	1.02E-07	ou
1,2,4-Trichlorobenzene	1.97E-07	2.08E+02	9.47E-10	no	1.38E-03	3.71E+04	3.72E-08	ou
Hexachtorobutadiene	2.04E-06	8.73E-02	2.34E-05	ou.	8.35E-03	3.21E+04	2.60E-07	92
Phenylacetylene	3.99E-06	N		na	7.00E-03	NV		па
d-Limonene	NA	≥		na	NA	3.50E+05		na
Methylnitrite	5.55E-06	N		na	9.72E-03	NV		Па
Acetonitrile	1.12E-05	6.20E+01	1.80E-07	2	7.82E-02	1.01E+05	7.76E-07	9

Table D-2: Comparison of Air Concentrations With Health-Based Values: Volatile Organic Compounds

			Rec	Smok	Red Smoke Grenade			
Compound (a)	С _{сhronic} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronlc} / HBSL	> 12	C _{acute} (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 12
Acrylonitrile	1.58E-06	2.80E-02	5.65E-05	2	6.46E-03	2.20E+04	2.94E-07	2
Nitromethane	3.33E-06	N N		na	2.33E-02	1.50E+05	1.55E-07	02
Benzonitrile	1.47E-05	N		na	1.03E-01	1.50E+04	6.86E-06	00
Nitrobenzene	5.08E-06	2.09E+00	2.43E-06	no	3.56E-02	1.51E+04	2.36E-06	OU
4-Methylbenzonitrile	NA	>N		na	AN	N		na
Carbon Disulfide	1.37E-03	7.30E+02	1.88E-06	ou	9.61E+00	3.73E+04	2.58E-04	00
Thiophene	8.94E-05	N N		na	1.57E-01	N		na
Dimethyldişulfide	3.31E-05	N N		na	5.79E-02	4.00E+01	1.45E-03	90
2-Methylthiophene	4.40E-06	N		na	7.71E-03	≥N		na
3-Methylthiophene	3.74E-06	N N		na	6.54E-03	N		na
Umethyltrisulfide	4.87E-05	N		na	8.54E-02	N		na
1-Chlorobutane	NA	1.46E+03		na	NA	N N		na
1-Bromo-2-chloroethane	NA	>N		na	AN	≥N		na
Z-Bromo-1-chioropropane	NA	N N		na	AN	N		na
1,2-Dichlorobutane	NA	NV		na	AN	N		na
1,2,3-Trichloropropane	NA	9.61E-04		na	NA	1.81E+05	·	na E
1-Chloro-2-methylbenzene	3.69E-04	7.30E+01	5.06E-06	no	2.59E+00	3.88E+05	6.67E-06	2
1-Chloro-3-methylbenzene	3.04E-05	N		na	5.32E-02	N N		na
1-Chloro-4-ethylbenzene	NA	N N		na	AN	> <u>N</u>		na
rentachloro-1-propene	NA	N		na	NA	N		na
1 2 Dichlore 3 mothylbores	1.08E-06	4.80E-01	2.25E-06	9	1.77E-02	2.90E+04	6.09E-07	o
eneziledilyiberizene	AN OF STATE	2		na	AA	N N		na
Trichlococopalisilo	1.28E-U5	N		na	8.96E-02	9.84E+03	9.11E-06	no
Distriction of the Control of the Co	AN L	N.		na	AA	N		na
Configuration	4.44E-06	2		na	7.78E-03	NV		na
1 Di-Line	Z.38E-U5	N<		na	4.20E-02	NV		na
1, 1-Dichloro-Z-propanone	NA.	N/S		na	AN	N		na
7-1 nioprienecarboxaidenyde	4.24E-06	N/		na	7.42E-03	NV		na
Change	7.42E-U5	8./3E-01	8.50E-05	9	3.03E-01	1.80E+04	1.68E-05	no
Acroleia	3.405-00	AN O		na	2.43E-02	5.64E+06	4.30E-09	no
Action	8.88E-05	2.09E-02	4.74E-03	2	1.73E-01	2.30E+02	7.53E-04	ou
ACBIOING	3.345-04	3.40E+02	9.82E-07	2	2.34E+00	2.37E+06	9.87E-07	00

Table D-2: Comparison of Air Concentrations With Health-Based Values: Volatile Organic Compounds

	AND THE PROPERTY OF THE PROPER			Smoke	Red Smoke Grenade			
Compound (a)	Cehronic (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronic} / HBSL	> 1?	C _{acute} (µg/m³)	Acute Toxicity Value (µg/m³)	C _{acute} / ATV	× 12
Propanal	NA	N		na	AN	7.50E+04		na
Furan	2.47E-05	3.70E+00	6.67E-06	no	1.73E-01	1.67E+02	1.04E-03	92
2-Propanol	7.13E-07	N		na	4.99E-03	9.84E+05	5.07E-09	OU
Methacrolein	8.16E-06	N		na	1.43E-02	> <u>N</u>		na
MTBE	AA	3.10E+03		na	ΑN	4.32E+05		na
Methyl-vinyt ketone	1.62E-05	N N		na	1.14E-01	8.61E+01	1.32E-03	92
2,3-Butanedione	3.00E-05	N		na	5.26E-02	≥		na
Butanal	5.06E-06	NV		na	3.55E-02	7.38E+04	4.81E-07	OU
2-Butanone	1.33E-05	1.00E+03	1.33E-08	no	9.30E-02	8.85E+05	1.05E-07	92
2-Methylfuran	1.43E-06	N		na	2.50E-03	ΛN		na
3-Methylfuran		N		na	NA	N N		na
trans-2-Butenal	1.14E-05	3.54E-03	3.22E-03	no	4.66E-02	N\		na
Tetrahydrofuran	NA	9.89E-01		na	NA	7.38E+05		na
3-Methyl-2-butanone		8.30E+01		na	NA	3.07E+05		na
Acetic Acid	2.96E-06	N		na	2.08E-02	3.68E+04	5.65E-07	92
1-Butanol	QΙ	3.65E+02	8.55E-09	no	2.19E-02	1.52E+05	1.44E-07	20
1-Penten-3-one		N		กล	NA	ΛN		na
2-Pentanone	1.77E-06	N		na	1.24E-02	8.80E+05	1.41E-08	OL
Pentanal	NA	N		na	NA	ΛN		na
2.3-Pentanedione	NA	N		na	NA	ΛN		na
1,2-Dichloro-2-methylpropane	ΑΝ	N		na	NA	>N		na
3-Pentanone	AN:	2		na	Ϋ́	≥ N		na
2.5-Dimethylfuran	NA NA	N		na	NA	N		na
4-Methyl-2-pentanone	3.70E-06	8.30E+01	4.46E-08	no	2.59E-02	3.07E+05	8.45E-08	no
trans-3-Penten-2-one	A N	N		na	NA	N		na
Cyclopentanone	NA	N.		na	NA	N		na
2-Hexanone	A'A	5.11E+00		na	NA	4.09E+04		na
Hexanal	5.70E-06	N		na	9.98E-03	N		na
3-Furaldehyde	\sim	N		na	3.87E-02	N N		na
2-Cyclopenten-1-one	NA	N	-	na	NA	ΛN		na
2-Furaldehyde	5.82E-05	5.20E+01	1.12E-06	00	4.08E-01	7.86E+03	5.19E-05	no
1-Acetoxyacetone	NA	N<		na	NA	N		na

Table D-2: Comparison of Air Concentrations With Health-Based Values: Volatile Organic Compounds

			Rec	Smok	Red Smoke Grenade			
Compound (a)	С _{chronic} (µg/m³)	Health-Based C _{chronic} (µg/m³) Screening Level	C _{chronic} / HBSL	> 12	C _{acute} (µg/m³)	Acute Toxicity Value (µg/m³)	Gacute/ ATV	> 12
2-Heptanone	7.34E-07	N		na	5.14E-03	7.01E+05	7.34E-09	00
Heptanal	1.43E-06	≥		na	2.51E-03	N		na
5-Methyl-2-furaldehyde	NA	N		na	AN	N		na
Benzaldehyde	2.20E-05	3.65E+02	6.03E-08	ou	1.54E-01	1.50E+04	1.03E-05	20
Benzofuran	6.49E-06	N		na	1.14E-02	Ž		na
Octanal	2.02E-06	λŅ		na	3.55E-03	>2		na
Acetophenone	AN	N N		na	ΑN	3.00E+04		na
2-Nonanone	NA	N N		na	ΑΝ	N N		na
Nonanal	1.81E-06	N N		na	3.17E-03	N N		na
Footnotes:								

(a) Items in bold represent duplicate values for those compounds that are common for Method TO-14 and TO-12.

NA = Not applicable

na = Not available because health-based screening value is not available or not applicable because compound was not detected.

NV = No value

C_{chronic} = Chronic time-averaged concentration HBSL = Chronic health-based screening level

Cacule = Acute concentration

ATV = Acute toxicity value

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Table D-3: Comparison of Air Concentrations With Health-Based Values: Semi-Volatile Organic Compounds

List okay - hy 20 jul 00			Red	Smok	Red Smoke Grenade			
Compound	C _{chronic} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronle} / HBSL	> 1?	C _{acute} (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 1?
Particulate/Vapor-phase SVOCs								
N-Nitrosodimethylamine	Ϋ́	1.40E-04		na	AN	2.50E+03		na
Pyridine	Ϋ́	3.65E+00		na	AN	4.85E+04		na
2-Picoline	Ν A	N<		na	AN	N		na
Methyl methanesulfonate	NA	N		na	NA	ΛN		na
N-Nitrosomethylethylamine	NA	3.06E-04		na	NA	NV		กล
N-Nitrosodiethylamine	NA	4.47E-05		na	ΝA	N/		na
Ethyi methanesulfonate	NA	NN		na	NA	NV		na
Phenol	AN	2.19E+03		na	AN	3.85E+05		na
Aniline	AN	1.06E+00		na	ΥN	3.00E+04		na
bis(2-Chloroethyl)ether	NA	5.80E-03		na	NA	5.85E+04		na
Pentachloroethane	NA	NN		na	NA	3.00E+04		na
2-Chlorophenol	NA	1.83E+01		na	ΑN	5.25E+03		na
1,3-Dichlorobenzene	NA	NV		na	NA	N		na
1,4-Dichlorobenzene	AN	2.80E-01		na	Y Y	6.61E+05		na
Benzyl alcohol	AN	1.10E+03		na	Ϋ́	5.53E+04		na
2-Methylphenol	AN	1.83E+02		na	Υ V	6.63E+04		na
1,2-Dichlorobenzene	NA .	2.09E+02		na	Ϋ́Α	3.01E+05		na
bis(2-Chloroisopropyl)ether	AN	1.92E-01		na	ΑN	6.99E+04		na
o-Toluidine	۷A	2.80E-02		na	AA	2.63E+04		na
4-Methylphenol/3-Methylphenol	AN	1.83E+01		na	Ϋ́	6.63E+04		na
N-Nitroso-dl-n-propylamine	ΑN	9.61E-04		na	Y V V	2.00E+02		na
Acetophenone	ΑN	2.10E-02		па	ΑN	3.00E+04		na
N-Nitrosomorpholine	ΑN	N		na	Y Y	3.00E+04		na
N-Nitrosopyrrolidine	NA	3.15E-03		na	Ϋ́	≩		na
Hexachloroethane	NA	4.80E-01		na	NA	2.90E+04		na
Nitrobenzene	AN	2.09E+00		na	NA	1.51E+04		na
N-Nitrosopiperidine	NA	NV		na	ΑN	N<		na
Isophorone	NA	7.08E+00		na	A'N	2.83E+04		na
2,4-Dimethylphenol	NA	7.30E+01		na	ΑN	N<		na
2-Nitrophenol	ΑN	N N		กล	Ϋ́	Š		na
bis(2-Chloroethoxy)methane	N.	N		na	Y V	N\		na
Benzolc acid	AN	1.50E+04		na	ΑΝ	1.25E+04		na
2,4-Dichlorophenol	A A	1.10E+01		na	Ϋ́	3.00E+04		na

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Table D-3: Comparison of Air Concentrations With Health-Based Values: Semi-Volatile Organic Compounds

	List okay - hy 20 jul 00	a service of the serv		Re	d Smok	Red Smoke Grenade			
NA 2.08E+02 na NA NA 3.13E+00 na NA NA 1.46E+01 na NA NA NV na NA NA NA NA NA NA 1.20E-03 na NA NA 1.20E-03 na NA NA NA NA NA NA	Compound	C _{chronic} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronic} / HBSL	> 12	C _{acute} (µg/m³)	Acute Toxicity Value (µg/m³)	Cacute/ ATV	> 12
NA 3.13E+00 na NA NA 1.46E+01 na NA NA NV na NA NA NA NA NA NA 3.65E+00 na NA NA 1.20E-03 na NA NA NA NV na NA NA NA NV na NA NA NA NA NA NA <td>1,2,4-Trichlorobenzene</td> <td>NA</td> <td>2.08E+02</td> <td></td> <td>na</td> <td>A'A</td> <td>3.71E+04</td> <td></td> <td>c c</td>	1,2,4-Trichlorobenzene	NA	2.08E+02		na	A'A	3.71E+04		c c
NA 1.46E+01 na NA NA NV na NA NA 3.62E+02 na NA NA 3.65E+03 na NA NA 1.20E+03 na NA NA 1.20E+03 na NA NA NV na NA NA NV na NA NA NA NA NA NA	Naphthalene	NA	3.13E+00		na	ΑΝ	7.86E+04		2 2
NA NV na NA NA 8.62E-02 na NA NA 3.65E+00 na NA NA 1.20E-03 na NA NA 1.20E-03 na NA NA NV na NA NA NV na NA NA NA NA NA NA <td< td=""><td>p-Chloroaniline</td><td>NA</td><td>1.46E+01</td><td></td><td>na</td><td>AN</td><td>3.00E+04</td><td></td><td>2 6</td></td<>	p-Chloroaniline	NA	1.46E+01		na	AN	3.00E+04		2 6
NA NV na NA NA 8.62E-02 na NA NA 1.20E-03 na NA NA NV na NA NA NV na NA NA 1.10E+00 na NA NA 1.10E+00 na NA NA 1.10E+00 na NA NA NA NA NA NA 1.10E+00 na NA NA NA NA NA NA	2,6-Dichlorophenol	NA	N		na	AA	3.00E+04		2 2
NA 8.62E-02 na NA NA 1.20E-03 na NA NA NV na NA NA NV na NA NA 1.10E-00 na NA NA 1.10E+00 na NA NA NA NA NA NA 1.10E+00 na NA NA NA NA NA NA	Hexachloropropene	A A	N		na	AN	N		2
NA 3.65E+00 na NA NA 1.20E-03 na NA NA NV na NA NA NV na NA NA 1.10E+00 na NA NA 1.10E+00 na NA NA 1.20E-01 na NA NA 1.20E-02 na NA NA NA NA NA NA	Hexachlorobutadiene	AA	8.62E-02		na	AN	3.21E+04		na
NA 1.20E-03 na NA NA NV na NA NA NV na NA NA 1.10E+00 na NA NA 7.30E-02 na NA NA 2.92E+02 na NA NA 2.92E+02 na NA NA NA NA NA NA	Dimethylphenethylamine	AA	3.65E+00		na	Ā	N<		E
NA NV na NA NA NV na NA NA 1.10E+00 na NA NA 7.30E-02 na NA NA 3.65E+02 na NA NA NA 1.00E+02 na NA NA NA 2.92E+02 na NA NA NA 2.92E+02 na NA NA NA NA NA	N-Nitroso-di-n-butylamine	NA A	1.20E-03		na	AN	N		na
NA NV na NA NA 1.10E+00 na NA NA 7.30E-02 na NA NA 6.20E-01 na NA NA 3.65E+02 na NA NA 2.92E+02 na NA NA 2.92E+02 na NA NA 2.09E+04 na NA NA NA 3.65E+04 na NA NA NA 3.65E+04 na NA NA NA NA NA NA <t< td=""><td>4-Chloro-3-methylphenol</td><td>NA</td><td>N</td><td></td><td>. na</td><td>AN</td><td>N N</td><td></td><td>na</td></t<>	4-Chloro-3-methylphenol	NA	N		. na	AN	N N		na
NA NA NA NA 1.10E+00 na NA NA 7.30E+02 na NA NA 6.20E+01 na NA NA 3.65E+02 na NA NA NV na NA NA 2.92E+02 na NA NA NV na NA NA 3.65E+02 na NA NA NA NA NA NA 3.65E+02 na NA NA 3.65E+04 na NA NA 3.65E+04 na NA NA NA NA NA NA NA NA NA NA NA NA NA NA 1.46E+01 na NA NA NA NA NA NA NA NA NA NA NA NA NA NA<	Sarrole	NA	N		na	NA	N<		na
NA 1.10E+00 na NA NA 7.30E-02 na NA NA 6.20E-01 na NA NA 3.65E+02 na NA NA 100E-01 na NA NA 100E+02 na NA NA 100E+02 <t< td=""><td>z-metnyinaphtnalene</td><td>A'N</td><td>N</td><td></td><td>na</td><td>AN</td><td>2.00E+04</td><td></td><td>na</td></t<>	z-metnyinaphtnalene	A'N	N		na	AN	2.00E+04		na
NA 7.30E-02 na NA NA 6.20E-01 na NA NA 3.65E+02 na NA NA 2.92E+02 na NA NA 2.92E+02 na NA NA 2.09E-01 na NA NA 3.65E+04 na NA NA 3.65E+04 na NA NA NA NA NA NA NA NA NA NA NA NA NA NA 7.30E+00 na NA NA 7.30E+00 na NA NA NA 7.30E+00 na NA NA NA 7.30E+00 na NA NA NA 1.46E+01 na NA NA NA NA NA NA NA NA NA NA NA NA NA NA </td <td>1,2,4,5-1 etrachlorobenzene</td> <td>A N</td> <td>1.10E+00</td> <td></td> <td>na</td> <td>AN</td> <td>3.00E+04</td> <td></td> <td>na</td>	1,2,4,5-1 etrachlorobenzene	A N	1.10E+00		na	AN	3.00E+04		na
NA 6.20E-01 na NA NA 3.65E+02 na NA NA 2.92E+02 na NA NA 2.92E+02 na NA NA 2.09E-01 na NA NA 3.65E+04 na NA NA 3.65E+00 na NA NA 3.65E+00 na NA NA NA NA NA NA NA NA NA NA NA NA NA NA 7.30E+00 na NA NA NA NA NA	Hexachlorocyclopentadiene	NA NA	7.30E-02		na	AN	2.23E+02		na
NA 3.65E+02 na NA NA 2.92E+02 na NA NA 2.09E-01 na NA NA 3.65E+04 na NA NA 3.65E+00 na NA NA 3.65E+00 na NA NA NA NA NA NA NA NA NA NA NA NA NA NA 2.90E+01 na NA NA 2.90E+02 na NA NA 1.46E+01 na NA NA NA NA NA	Z,4,6-1 richlorophenol	AN	6.20E-01		na	AN	3.00E+04		Ba
NA NV na NA NA 2.92E+02 na NA NA 2.09E-01 na NA NA 3.65E+04 na NA NA 3.65E+00 na NA NA 3.65E+00 na NA NA NV na NA NA NV na NA NA 2.90E+01 na NA NA 7.30E+00 na NA NA 7.30E+00 na NA NA 1.46E+01 na NA NA NA NA NA	2,4,5-1 richlorophenol	AA	3.65E+02		na	AN	3.00E+04		na
NA 2.92E+02 na NA NA 2.09E-01 na NA NA 3.65E+04 na NA NA 3.65E+00 na NA NA 3.65E+00 na NA NA 3.65E+00 na NA NA NV na NA NA 2.90E+01 na NA NA 7.30E+00 na NA NA 7.30E+00 na NA NA 1.46E+01 na NA NA NA 1.10E+02 na NA NA NA NA NA NA NA NA	Isosatrole	AN	N		na	AN	≥ N		na
NA 2.09E-01 na NA NA 3.65E+04 na NA NA 3.65E+04 na NA NA 3.65E+00 na NA NA 3.65E+00 na NA NA NV na NA NA 2.90E+01 na NA NA 7.30E+00 na NA NA 7.30E+00 na NA NA 1.46E+01 na NA NA NA 1.10E+02 na NA NA NA 1.10E+02 na NA NA NA NA NA NA NA	z-Cnioronaphinalene	AN	2.92E+02		na	AN	6.00E+02		na
NA NV na NA NA 3.65E+04 na NA NA 3.65E+01 na NA NA 3.65E+00 na NA NA 3.65E+00 na NA NA 1.00E+01 na NA NA 2.90E+01 na NA NA 7.30E+00 na NA NA 7.30E+00 na NA NA 1.46E+01 na NA NA NA 1.10E+02 na NA NA 1.10E+02 na NA NA NA NA NA NA NA NA NA NA NA NA NA NA 1.10E+02 na NA NA NA NA NA NA 1.10E+02 na NA NA 1.10E+02 na NA NA 1.10E+02	Z-Nitroanline	AA	2.09E-01		na	AN	≥		na
NA 3.65E+04 na NA NA 3.65E+01 na NA NA 3.65E+00 na NA NA NV na NA NA 2.90E+01 na NA NA 7.30E+00 na NA NA 7.30E+00 na NA NA 7.30E+00 na NA NA 1.46E+01 na NA NA 1.46E+01 na NA NA NA NA NA NA 1.10E+02 na NA NA NA NA NA	Di-4-Ivaphrnoquinone	AN.	2		na	NA.	2.50E+02		na
NA 3.65E-01 na NA NA NV na NA NA NV na NA NA 2.90E+01 na NA NA 7.30E+00 na NA NA 7.30E+00 na NA NA 7.30E+00 na NA NA 1.46E+01 na NA NA 1.46E+01 na NA NA NA NA NA NA NA 1.10E+02 na NA NA 1.10E+02 na NA NA NA NA NA	Umemyiphthalate	AN	3.65E+04		na	AN	1.50E+04		na
NA 3.65E+00 na NA NA NV na NA NA 2.90E+01 na NA NA 7.30E+00 na NA NA 7.30E+00 na NA NA 7.30E+00 na NA NA 1.46E+01 na NA NA 1.46E+01 na NA NA NA NA NA NA NA NA NA NA 1.10E+02 na NA NA 1.10E+02 na NA NA NA NA NA	1,3-Unitrobenzene	A N	3.65E-01		na	NA	3.00E+03		na
NA NV na NA NA 2.90E+01 na NA NA 7.30E+00 na NA NA 7.30E+00 na NA NA 1.46E+01 na NA NA 2.92E+00 na NA NA NV na NA NA NV na NA NA 1.10E+02 na NA NA NA na NA NA NA 2.92E+03 na NA	Acceptification	Y .	3.65E+00		na	NA	6.00E+02		na
NA 2.90E+01 na NA NA 7.30E+00 na NA NA NA 7.30E+00 na NA NA NA 7.30E+00 na NA NA NA 1.46E+01 na	3-Nitrocollino	AN A	2		na	NA	2.00E+02		na
NA 2.90E+01 na NA NA 7.30E+00 na NA NA 7.30E+02 na NA NA 1.46E+01 na NA NA NA NA NA NA NV na NA NA NV na NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA NA	4-Nitrophood	X < X	N 100 0		na	NA	N	·	na
NA 2.19E+00 na NA NA 7.30E+00 na NA NA 1.46E+01 na NA NA NV na NA NA NA NA NA NA NA NA NA NA	2 4-Dinitrophonol	42	Z.90E+01		na	ΥN	3.00E+04		na
NA 2.19E+02 na NA NA 7.30E+00 na NA NA 1.46E+01 na NA NA NV na NA NA NV na NA NA NV na NA NA NV na NA NA 1.10E+02 na NA NA NA na NA	A A Constitution	42	7.30E+00		na	ΥN	7.50E+03		na
NA 7.30E+00 na NA NA 1.46E+01 na NA NA 2.92E+00 na NA NA NV na NA NA NV na NA NA 1.10E+02 na NA NA NA na NA	2 4-Digitatologo	AN S	2.19E+02		na	ΝΑ	1.25E+03		na
NA 2.92E+00 na NA NA 2.92E+00 na NA NA NV na NA NA NV na NA NA NA NA 1.10E+02 na NA NA 1.292E+03 na NA	Principal discontinuation	YY.	7.30E+00		na	NA	6.00E+02		na
NA NV na	Pantachlorohorzono	Y S	1.46E+01		na	A'A	1.50E+00		na
NA N	1-Naphthydamiae	4	Z.9ZE+00		na	AA	3.00E+04		na
NA 1.10E+02 na	2.Noobthylomioo	X .	N.		na	NA A	3.50E+04		na
NA 1.10E+02 na NA 2.92E+03 na NA	2 3 4 6 Tetrachioranhani	AN.	N		na	AA	7.50E+03		na
NA 2.92E+03 na NA	Dietalatistici	Y.	1.10E+02		na	AN	NV		na
	Viculyipilitialate	NA.	2.92E+03		па	Ä	1.50E+04		na

Table D-3: Comparison of Air Concentrations With Health-Based Values: Semi-Volatile Organic Compounds

List okay - hy 20 jul 00		The Crenade	Rec	Smok	9 Grenade	20.00		
Compound	C _{chronle} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronic} / HBSL	> 1?	C _{acute} (µg/m³)	Acute Toxicity Value (μg/m³)	Cacute/ ATV	> 12
4-Chlorophenylphenyl ether	ΝΑ	N		na	NA	> <u>N</u>		na
Fluorene	NA	1.46E+02		na	NA	7.50E+04		na
5-Nitro-o-toluidine	NA	2.00E-01		na	NA	NN		na
4-NitroanIIIne	۷A	N.		na	NA	9.00E+03		na
4,6-Dinitro-2-methylphenol	NA	3.65E-01		na	NA	5.00E+02		na
Diphenylamine/N-NitrosoDPA	NA	1.37E-04		na	NA	2.50E+03		na
sym-Trinitrobenzene	- NA	1.10E+02		na	NA	3.00E+04		na
Diallate	NA	1.10E-01		na	NA	N/		na
Phenacetin	NA	N		na	NA	3.00E+04		na
4-Bromophenylphenyl ether	NA	N\		na	NA	N/		na
Hexachlorobenzene	AN	4.18E-03		na	NA	7.50E+01		na En
4-Aminobiphenyl	AN	NV		ทล	NA	1.50E+03		na
Pronamide	NA	2.74E+02		na	NA	N		na
Pentachlorophenol	NA	5.60E-02		na	NA	1.50E+03		na
Pentachloronitrobenzene	Ϋ́	2.59E-02		na	ΝΑ	1.50E+03		na
Phenanthrene	Ϋ́	≥		na	Ϋ́	2.00E+03		na
Anthracene	ΑN	1.10E+03		na	ΝΑ	6.00E+03		na
Carbazole	ΑN	3.36E-01		na	NA	N		na
Di-n-butylphthalate	۸N	3.65E+02		na	ΝA	1.50E+04		na
4-Nitroquinoline-1-oxide	AN	N		na	ΑN	N		na
Methapyrilene	NA NA	N		na	Ϋ́	N<		na
Fluoranthene	NA	1.46E+02		na	AN	3.00E+01		na
Benzidine	A'A	2.90E-05		na	Y A	5.00E+02		na
Pyrene	AN N	1.10E+02		na	AN.	1.50E+04		na
p-Dimethylaminoazobenzene	A A	N		na	Ϋ́	7.50E+04		na
Chlorobenzilate	Ϋ́	2.49E-02		na	ΑΝ	2.50E+02		กล
Kepone	NA	3.74E-04		na	AN	1.00E+02		na
Butylbenzylphthalate	AN	7.30E+02		na	AA	5.00E+05		na
3,3'-Dimethylbenzidine	A A	7.30E-04		na	Ϋ́	3.00E+00		na
2-Acetylaminoflyorene	ΑN	2		пa	Ϋ́	2.50E+03		na
bis(2-Ethylhexyl)phthalate	A N	4.80E-01		па	¥	1.00E+04		na
3,3'-Dichlorobenzidine	ΑN	1.50E-02		na	¥.	6.21E+03		na
Benz(a)anthracene	ΨZ.	2.17E-02		na	¥	6.00E+02		na
Chrysene	AN	2.17E+00		na	NA	2.00E+02		na

Table D-3: Comparison of Air Concentrations With Health-Based Values: Semi-Volatile Organic Compounds

List okay - hy 20 jul 00			Rec	I Smok	Red Smoke Grenade			
Compound	C _{chronle} (µg/m³)	Health-Based Screening Level (µg/m³)	C _{chronic} / HBSL	> 12	C _{acute} (µg/m³)	Acute foxicity Value (µg/m³)	Gacute/ ATV	> 13
Di-n-octylphthalate	ΑN	7.30E+01		na	ΑN	1.50E+05		20
7,12-Dimethylbenz(a)anthracene	ΑN	N		na	AN	N		60
Benzo(b)fluoranthene	ΝΑ	2.17E-02		na	AN	≥N		eu
Benzo(k)fluoranthene	NA	2.17E-01		na	ΑN	2		800
Benz(a)pyrene	ΝA	2.17E-03		na	AN	7.50E+03		e
3-Methylcholanthrene	NA	N/		na	ΑN	1.50E+03		0 0
Indeno(1,2,3-cd)pyrene	NA	2.17E-02		na	ΑN	2		2 0
Dibenz(a,h)anthracene	NA	2.17E-03		na	Ϋ́	3.00E+04		3 0
Benzo(g,h,i)perylene	A'A	N		Ba	AN	3 00F+04		3
2-(2-quinolinyl)-(H-indane-1,3-(2H)-dione	AA	N		e	ΑN	NV		0
Benzanthrone	AN	2		e C	ΑN	N/N		ם פ
Tetrachloroethene	A'N	3.31E+00		E L	ΑN	6 78E+05		2 2
(1,2-dichloroethyl)-benzene	AN	N		20	ΔN	NV NV		2 2
4-phenoxy-2(1H)-quinolinone	AN	≥		20	ΔN	MV		0 0
3-(phenylhydrazone)-1H-Indole-2,3-dione	2.34E-01	≥		2	4 10E+02	N. N.		0
4-1,2,4-oxadizaolin-3-one-2,5-diphenyl-delta	AN AN	NA NA		2 2	N. V.	AN.		na
2-amino-9,10-anthracenedione	9 61E-03	AIN		<u> </u>	¥200	2		na
Footnotes:	2012	À		B	1.68E+01	N		na

NA = Not applicable

na = Not available because health-based screening value is not available or not applicable because compound was not detected.

NV = No value

Conronc = Chronic time-averaged concentration

HBSL ≈ Chronic health-based screening level

C_{ecule} = Acute concentration ATV = Acute toxicity value

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Table D-4: Comparison of Air Concentrations With Health-Based Values: Total Petroleum Hydrocarbons

		Red Smoke Grenade	e Grenade	
Compound (a)	C _{chronic} (µg/m³)	С _{сhronic} (µg/m³)	Сенгопіс (µg/m³)	C _{chronic} (µg/m³)
	Allphatic:C<=8	Aliphatic:C>8	Aromatic:C<=8	Aromatic:C>8
C _{chronlo} /HBSL	5.87E-09	0.00E+00	1.76E-07	1.16E-07
>1?	no	on O	OU	on O

Footnotes:

(a) Items in bold represent duplicate values: highest concentration was used to estimate total petroleum hydrocarbon concentration >1? = Is the ratio greater than one?

NA = Not Applicable because compound was not detected

C_{chronk} = chronic averaged air Concentration

HBSL = Health-Based Screening Level

Table D-4: Comparison of Air Concentrations With Health-Based Values: Total Petroleum Hydrocarbons

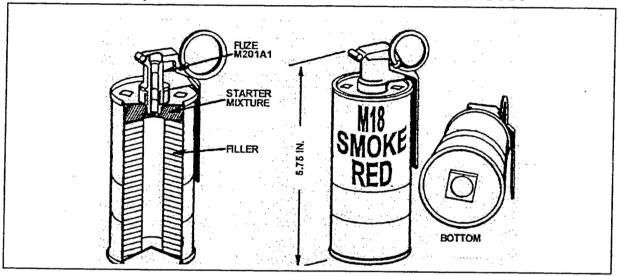
		Red Smok	Red Smoke Grenade	
Compound (a)	С _{енгопіс} (µg/m³)	C _{chronic} (µg/m³)	С _{сhronic} (µg/m³)	C _{chronic} (µg/m³)
	Allphatic:C<=8	Allphatic:C>8	Aromatic:C<=8	Aromatic. CSB
Propane	1.41E-06	NA	NA	NA
Propene	5.68E-05	AN	AN	NΑ
i-Butane	1.37E-07	AN	NA	ΔN
i-Butene	7.61E-06	NA	NA	V.V.
1-Butene	1.18E-05	NA	NA.	AN
n-Butane	5.40E-07	NA	AN	AN
trans-2-Butene	1.07E-05	NA	NA	NA
cls-2-Butene	2.49E-06	NA	NA	NA
3-Methyl-1-butene	1.92E-06	AN	NA	AN
1-Pentene	5.70E-06	NA	NA	AN
2-Methyl-1-butene	3.26E-06	NA	AN	AM
trans-2-Pentene	3.26E-06	NA	NA	ΔN
1-Hexene	7.06E-06	AN	AN	ΔN
Benzene	NA	NA	6 19F-05	VIV.
Toluene	AN	NA	6 50F-06	
Ethylbenzene	NA AN	NA	2.36F-06	₹ \ 2
m-Xylene & p-Xylene	AA	NA	1 505-05	2 2
o-Xylene	AN	NA A	1.38F-06	2 2
n-Decane	NA	AN	NA	3 975-06
Benzene	NA	NA	6.30E-05	AN
euenio i	NA	NA	6.61E-06	ΔN
Ethylbenzene	NA	AN	3.62E-06	ΔN
m&p-Xylene	NA	AN	1.52E-05	ΔN
o•Xylene	NA	NA	1.40E-06	ΔN
rnenylacetyjene	NA	NA	3.99E-06	NA
Total (µg/m³)	1.13E-04	0.00E+00	7.36E-05	2.42E-05
Derived Realth-Based Screening Level	1.92E+04	1.04E+03	4.17E+02	2.09E+02

APPENDIX E FACT SHEET SUBMITTED TO AEC

United States Army Environmental Center Pyrotechnics Fact Sheet

M18 Red-Colored Smoke Grenade

Department of Defense Identification Code: G950



Breathing air emissions from the red-colored smoke grenade will not impact the health of residents who live near Army training facilities.

WHAT ARE PYROTECHNICS?

The terms pyrotechnics and fireworks are often used interchangeably. Pyrotechnics are devices that give off smoke, light, and/or a loud noise when activated. In the military, pyrotechnics are used for signaling, obscuring, and illuminating during training and combat.

WHAT IS THE M18?

The M18 smoke grenade is a type of pyrotechnic device used by troops for ground-to-ground or ground-to-air signaling. The M18 may be filled with one of four different smoke colors. These different colored smoke signals can be seen over great distances when used against a terrain background of contrasting colors. The M18 is 5.75

inches long, 2.50 inches in diameter, and weighs 19 ounces.

HOW IS THE M18 USED?

The M18 contains a delay-igniting fuze that smoke is not released immediately after the grenade is activated. This allows the user to throw the grenade, usually to a distance of about 35 meters (115 feet) before smoke is produced. The M18 will emit a cloud of colored smoke for 50 to 90 seconds. This colored smoke can be used for different purposes. example, it can be used to mark friendly force locations for other ground troops. It can also be used to mark a landing zone during operations such as medical evacuation.

WHERE IS THE RED-COLORED M18 USED?

The red-colored M18 is used during many Army training events. These events are held at nearly every Army training installation. At most locations, the training areas are at least 1000 meters (over half a mile) away from populated areas. In general, two of these items are used during a day of training, which typically occurs five times per year.

WHAT IS IN THE RED-COLORED M18?

The body of the red-colored M18 consists of a thin cylinder of sheet metal that is filled with a red smoke mixture. This mixture us made up mostly of a red dye, potassium chlorate, and sodium bicarbonate (same as baking soda).

WILL BREATHING AIR EMISSIONS FROM THE RED-COLORED M18 AFFECT MY HEALTH?

To answer this question, the U.S. Army Environmental Center tested the air emissions from the red-colored M18. The U.S. Army Center for Health Promotion and Preventive Medicine then determined if there would be a potential for health effects from inhalation to residents living near training areas. Results showed that residents breathing air as close as 100 meters (328 feet) from the activation site are safe from these emissions.

HOW WAS THE STUDY DONE?

To gather data for the study, airborne emissions were collected by activating the red-colored M18 in a test chamber. The air in the chamber was tested to identify the types and the amount of substances released. More than 300 substances were looked for during this part of the study.

This information was then used in an air model (a computer program that allows estimation of air concentrations) to determine the amount of substance, to which someone living near a training area might be exposed. Downwind concentrations estimated based on a typical use scenario for the red-colored M18. Since the study does not look at a specific training area, the assumptions used in the model will in most cases, predict higher downwind air concentrations than those expected at an actual training site.

These estimated air concentrations were then compared to safe screening levels established by the U.S. Environmental Protection Agency and other agencies. If the air concentrations are below these screening levels, they are considered safe for everyone, including sensitive people such as the sick, elderly, and children.

WHAT ARE THE LIMITATIONS OF THIS STUDY?

Many steps were taken to ensure that the results of this study are protective of everyone who lives close to training areas. However, limitations do exist with this study. For example, the study does not consider exposure to other types of munitions that could also be used during the same training event. Due to these limitations, conservative model conditions were used to ensure the protection of public health from inhalation of the red-colored M18 air emissions.

WHERE CAN I GET MORE INFORMATION?

For more information on the M18 and other military munitions call the Army Environmental Hotline at 1-800-USA-3845, visit our website at www.aec.army.mil, or email us at t2hotline@aec.apgea.army.mil.